crewmembers on United States registered aircraft engaged in international air commerce. The purpose of the certificate is to facilitate the entry and clearance of those crewmembers into ICAO contracting states. They were issued under Annex 9, as amended, to the Convention on International Civil Aviation.

[Doc. No. 28154, 61 FR 30435, June 14, 1996]

§ 121.723 Surrender of international crewmember certificate.

The holder of a certificate issued under this section, or the air carrier by whom the holder is employed, shall surrender the certificate for cancellation at the nearest FAA Flight Standards District Office at the termination of the holder's employment with that air carrier.

[Doc. No. 28154, 61 FR 30435, June 14, 1996]

APPENDIX A TO PART 121—FIRST-AID KITS AND EMERGENCY MEDICAL KITS

First-Aid Kits

Approved first-aid kits required by §121.309 must meet the following specifications and requirements:

(1) Each first-aid kit must be dust and moisture proof, and contain only materials that either meet Federal Specification GG–K–391a, as revised, or are approved.

(2) Required first-aid kits must be distributed as evenly as practicable throughout the aircraft and be readily accessible to the cabin flight attendants.

(3) The minimum number of first-aid kits required is set forth in the following table:

No. of passenger seats	No. of first-aid kits
0–50	1
51–150	2
151–250	3
More than 250	4

(4) Except as provided in paragraph (5), each first-aid kit must contain at least the following or other approved contents:

Contents	Quantity
Adhesive bandage compresses, 1-inch	16
Antiseptic swabs	20
Ammonia inhalants	10
Bandage compresses, 4-inch	8
Triangular bandage compresses, 40–inch	5
Arm splint, noninflatable	1
Leg splint, noninflatable	1
Roller bandage, 4–inch	4
Adhesive tape, 1–inch standard roll	2
Bandage scissors	1

(5) Arm and leg splints which do not fit within a first-aid kit may be stowed in a readily accessible location that is as near as practicable to the kit.

Emergency Medical Kits

The approved emergency medical kit required by §121.309 for passenger flights must meet the following specifications and requirements:

(1) Approved emergency medical equipment shall be stored securely so as to keep it free from dust, moisture, and damaging temperatures.

(2) One approved emergency medical kit shall be provided for each aircraft during each passenger flight and shall be located so as to be readily accessible to crewmembers.

(3) Except as provided in paragraph (4) of this appendix, the approved emergency medical kit must contain, as a minimum, the following appropriately maintained contents in the specified quantities:

Contents	Quantity
Sphygmomanometer	1
Stethoscope	1
Airways, oropharyngeal (3 sizes)	3
Syringes (sizes necessary to administer required drugs)	4
Needles (sizes necessary to administer required drugs)	6
50% Dextrose injection, 50cc	1
Epinephrine 1:1000, single dose ampule or equivalent	2
Diphenhydramine HCI injection, single dose ampule or equivalent	2
Nitroglycerin tablets	10
Basic instructions for use of the drugs in the kit	1
Protective latex gloves or equivalent	[1] 1

[1] Pair.

(4) Until June 3, 1996, required protective latex gloves or equivalent nonpermeable gloves may be placed in the emergency medical kit or in a location that is readily accessible to crewmembers.

[Doc. No. 12384, 38 FR 35234, Dec. 26, 1973, as amended by Amdt. 121–115, 40 FR 1039, Jan. 6, 1975; Amdt. 121–188, 51 FR 1223, Jan. 9, 1986; Amdt. 121–236, 59 FR 1781, Jan. 12, 1994; Amdt. 121–242, 59 FR 52642, Oct. 18, 1994; Amdt. 121–243, 59 FR 62276, Dec. 2, 1994]

APPENDIX B TO PART 121—AIRPLANE FLIGHT RECORDER SPECIFICATION

Parameters	Range	Accuracy sensor input to DFDR readout	Sampling interval (per second)	Resolution [4] readout
Time (GMT or Frame Counter) (range 0 to 4095, sampled 1 per frame).	24 Hrs	±0.125% Per Hour	0.25 (1 per 4 seconds).	1 sec.
Altitude	−1,000 ft to max certificated altitude of aircraft.	±100 to ±700 ft (See Table 1, TSO–C51a).	1	5′ to 35′ [1]
Airspeed	50 KIAS to V_{so}, and V_{so} to 1.2 V_D.	±5%, ±3%	1	1 kt.
Heading	360°	±2°	1	0.5°
Normal Acceleration (Vertical)	−3g to +6g	±1% of max range excluding datum error of ±5%.	8	0.01g.
Pitch Attitude	±75°	±2°	1	0.5°
Roll Attitude	±180°	±2°	1	0.5°
Radio Transmitter Keying	On-Off (Discrete)	±2°	±2%	
Thrust/Power on Each Engine	Full Range Forward	±2°	1 (per engine)	0.2% [2]
Trailing Edge Flap or Cockpit Control Selection.	Full Range or Each Discrete Position.	±3° or as Pilot's Indicator	0.5	0.5% [2]
Leading Edge Flap or Cockpit Control Selection.	Full Range or Each Discrete Position.	±3° or as Pilot's Indicator	0.5	0.5% [2]
Thrust Reverser Position	Stowed, In Transit, and Reverse (Discrete).		1 (per 4 seconds per engine).	
Ground Spoiler Position/ Speed Brake Selection.	Full Range or Each Discrete Position.	±2% Unless Higher Accuracy Uniquely Required.	1	0.2% [2].
Marker Beacon Passage	Discrete		1	
Autopilot Engagement	Discrete		1	
Longitudinal Acceleration	±1g	±1.5% max range excluding datum error of ±5%.	4	0.01g.
Pilot Input and/or Surface Position—Primary Controls (Pitch, Roll, Yaw) [3].	Full Range	±2° Unless Higher Accuracy Uniquely Required.	1	0.2% [2].
Lateral Acceleration	±1g	±1.5% max range excluding datum error of ±5%.	4	0.01g.
Pitch Trim Position	Full Range	±3% Unless Higher Accuracy Uniquely Required.	1	0.3% [2].
Glideslope Deviation	±400 Microamps	±3%	1	0.3% [2].
Localizer Deviation	±400 Microamps	±3%	1	0.3% [2].
AFCS Mode and Engagement Status.	Discrete		1	
Radio Altitude	−20 ft to 2,500 ft	±2 Ft or ±3% Whichever is Greater Below 500 Ft and ±5% Above 500 Ft.	1	1 ft + 5% [2] above 500′.
Master Warning	Discrete		1	
Main Gear Squat Switch Status.	Discrete		1	
Angle of Attack (if recorded directly)..	As installed	As installed	2	0.3% [2]
Outside Air Temperature or Total Air Temperature..	−50° C to +90° C	±2° c	0.5	0.3° c
Hydraulics, Each System Low Pressure.	Discrete		0.5	or 0.5% [2]
Groundspeed.	As installed	Most Accurate Systems Installed (IMS Equipped Aircraft Only).	1	0.2% [2]
If additional recording capacity is available, recording of the following parameters is recommended. The parameters are listed in order of significance:				
Drift Angle	When available, As installed.	As installed	4	
Wind Speed and Direction	When available, As installed.	As installed	4	
Latitude and Longitude	When available, As installed.	As installed	4	
Brake pressure/Brake pedal position.	As installed	As installed	1	
Additional engine parameters:				
EPR	As installed	As installed	1 (per engine).	
N1	As installed	As installed	1 (per engine).	
N2	As installed	As installed	1 (per engine).	
EGT	As installed	As installed	1 (per engine).	

Parameters	Range	Accuracy sensor input to DFDR readout	Sampling interval (per second)	Resolution [4] readout
Throttle Lever Position	As installed	As installed	1 (per engine).	
Fuel Flow	As installed	As installed	1 (per engine).	
TCAS:				
TA	As installed	As installed	1	
RA	As installed	As installed	1	
Sensitivity level (as selected by crew).	As installed	As installed	2	
GPWS (ground proximity warning system).	Discrete		1	
Landing gear or gear selector position.	Discrete		0.25 (1 per 4 seconds).	
DME 1 and 2 Distance	0–200 NM;	As installed	0.25	1 mi.
Nav 1 and 2 Frequency Selection.	Full range	As installed	0.25	

[1] When altitude rate is recorded. Altitude rate must have sufficient resolution and sampling to permit the derivation of altitude to 5 feet.
[2] Per cent of full range.
[3] For airplanes that can demonstrate the capability of deriving either the control input on control movement (one from the other) for all modes of operation and flight regimes, the ''or'' applies. For airplanes with non-mechanical control systems (fly-by-wire) the ''and'' applies. In airplanes with split surfaces, suitable combination of inputs is acceptable in lieu of recording each surface separately.
[4] This column applies to aircraft manufactured after October 11, 1991.

[Doc. No. 25530, 53 FR 26147, July 11, 1988; 53 FR 30906, Aug. 16, 1988]

APPENDIX C TO PART 121—C–46 NONTRANSPORT CATEGORY AIRPLANES

Cargo Operations

1. *Required engines.* (a) Except as provided in paragraph (b) of this section, the engines specified in subparagraphs (1) or (2) of this section must be installed in C–46 nontransport category airplanes operated at gross weights exceeding 45,000 pounds:

(1) Pratt and Whitney R2800–51–M1 or R2800–75–M1 engines (engines converted from basic model R2800–51 or R2800–75 engines in accordance with FAA approved data) that—

(i) Conform to Engine Specification 5E–8;

(ii) Conform to the applicable portions of the operator's manual;

(iii) Comply with all the applicable airworthiness directives; and

(iv) Are equipped with high capacity oil pump drive gears in accordance with FAA approved data.

(2) Other engines found acceptable by the FAA Regional Flight Standards Division having type certification responsibility for the C–46 airplane.

(b) Upon application by an operator conducting cargo operations with nontransport category C–46 airplanes between points within the State of Alaska, the appropriate FAA Flight Standards District Office, Alaskan Region, may authorize the operation of such airplanes, between points within the State of Alaska; without compliance with paragraph (a) of this section if the operator shows that, in its area of operation, installation of the modified engines is not necessary to provide adequate cooling for single-engine operations. Such authorization and any conditions or limitations therefor is made a part of the Operations Specifications of the operator.

2. *Minimum acceptable means of complying with the special airworthiness requirements.* Unless otherwise authorized under §121.213, the data set forth in sections 3 through 34 of this appendix, as correlated to the C–46 nontransport category airplane, is the minimum means of compliance with the special airworthiness requirements of §§121.215 through 121.281.

3. *Susceptibility of material to fire.* [Deleted as unnecessary]

4. *Cabin interiors.* C–46 crew compartments must meet all the requirements of §121.215, and, as required in §121.221, the door between the crew compartment and main cabin (cargo) compartment must be flame resistant.

5. *Internal doors.* Internal doors, including the crew to main cabin door, must meet all the requirements of §121.217.

6. *Ventilation.* Standard C–46 crew compartments meet the ventilation requirements of §121.219 if a means of ventilation for controlling the flow of air is available between the crew compartment and main cabin. The ventilation requirement may be met by use of a door between the crew compartment and main cabin. The door need not have louvers installed; however, if louvers are installed, they must be controllable.

7. *Fire precautions.* Compliance is required with all the provisions of §121.221.

(a) In establishing compliance with this section, the C–46 main cabin is considered as a Class A compartment if—

(1) The operator utilizes a standard system of cargo loading and tiedown that allows easy access in flight to all cargo in such compartment, and, such system is included

in the appropriate portion of the operator's manual; and

(2) A cargo barrier is installed in the forward end of the main cabin cargo compartment. The barrier must—

(i) Establish the most forward location beyond which cargo cannot be carried;

(ii) Protect the components and systems of the airplane that are essential to its safe operation from cargo damage; and

(iii) Permit easy access, in flight, to cargo in the main cabin cargo compartment.

The barrier may be a cargo net or a network of steel cables or other means acceptable to the Administrator which would provide equivalent protection to that of a cargo net. The barrier need not meet crash load requirements of FAR §25.561; however, it must be attached to the cargo retention fittings and provide the degree of cargo retention that is required by the operators' standard system of cargo loading and tiedown.

(b) C–46 forward and aft baggage compartments must meet, as a minimum, Class B requirements of this section or be placarded in a manner to preclude their use as cargo or baggage compartments.

8. *Proof of compliance.* The demonstration of compliance required by §121.223 is not required for C–46 airplanes in which—

(1) The main cabin conforms to Class A cargo compartment requirements of §121.219; and

(2) Forward and aft baggage compartments conform to Class B requirements of §121.221, or are placarded to preclude their use as cargo or baggage compartments.

9. *Propeller deicing fluid.* No change from the requirements of §121.225. Isopropyl alcohol is a combustible fluid within the meaning of this section.

10. *Pressure cross-feed arrangements, location of fuel tanks, and fuel system lines and fittings.* C–46 fuel systems which conform to all applicable Curtiss design specifications and which comply with the FAA type certification requirements are in compliance with the provisions of §§121.227 through 121.231.

11. *Fuel lines and fittings in designated fire zones.* No change from the requirements of §121.233.

12. *Fuel valves.* Compliance is required with all the provisions of §121.235. Compliance can be established by showing that the fuel system conforms to all the applicable Curtiss design specifications, the FAA type certification requirements, and, in addition, has explosion-proof fuel booster pump electrical selector switches installed in lieu of the open contact type used originally.

13. *Oil lines and fittings in designated fire zones.* No change from the requirements of §121.237.

14. *Oil valves.* C–46 oil shutoff valves must conform to the requirements of §121.239. In addition, C–46 airplanes using Hamilton Standard propellers must provide, by use of stand pipes in the engine oil tanks or other approved means, a positive source of oil for feathering each propeller.

15. *Oil system drains.* The standard C–46 ''Y'' drains installed in the main oil inlet line for each engine meet the requirements of §121.241.

16. *Engine breather line.* The standard C–46 engine breather line installation meets the requirements of §121.243 if the lower breather lines actually extend to the trailing edge of the oil cooler air exit duct.

17. *Firewalls and firewall construction.* Compliance is required with all of the provisions of §§121.245 and 121.247. The following requirements must be met in showing compliance with these sections:

(a) *Engine compartment.* The engine firewalls of the C–46 airplane must—

(1) Conform to type design, and all applicable airworthiness directives;

(2) Be constructed of stainless steel or approved equivalent; and

(3) Have fireproof shields over the fairleads used for the engine control cables that pass through each firewall.

(b) *Combustion heater compartment.* C–46 airplanes must have a combustion heater fire extinguishing system which complies with AD–49–18–1 or an FAA approved equivalent.

18. *Cowling.* Standard C–46 engine cowling (cowling of aluminum construction employing stainless steel exhaust shrouds) which conforms to the type design and cowling configurations which conform to the C–46 transport category requirements meet the requirements of §121.249.

19. *Engine accessory section diaphragm.* C–46 engine nacelles which conform to the C–46 transport category requirements meet the requirements of §121.251. As provided for in that section, a means of equivalent protection which does not require provision of a diaphragm to isolate the engine power section and exhaust system from the engine accessory compartment is the designation of the entire engine compartment forward of and including the firewall as a designated fire zone, and the installation of adequate fire detection and fire extinguishing systems which meet the requirements of §121.263 and §121.273, respectively, in such zone.

20. *Powerplant fire protection.* C–46 engine compartments and combustion heater compartments are considered as designated fire zones within the meaning of §121.253.

21. *Flammable fluids—*

(a) *Engine compartment.* C–46 engine compartments which conform to the type design and which comply with all applicable airworthiness directives meet the requirements of §121.255.

(b) *Combustion heater compartment.* C–46 combustion heater compartments which conform to type design and which meet all the

requirements of AD–49–18–1 or an FAA approved equivalent meet the requirements of §121.255.

22. *Shutoff means*—

(a) *Engine compartment.* C–46 engine compartments which comply with AD–62–10–2 or FAA approved equivalent meet the requirements of §121.257 applicable to engine compartments, if, in addition, a means satisfactory to the Administrator is provided to shut off the flow of hydraulic fluid to the cowl flap cylinder in each engine nacelle. The shutoff means must be located aft of the engine firewall. The operator's manual must include, in the emergency portion, adequate instructions for proper operation of the additional shutoff means to assure correct sequential positioning of engine cowl flaps under emergency conditions. In accordance with §121.315, this positioning must also be incorporated in the emergency section of the pilot's checklist.

(b) *Combustion heater compartment.* C–46 heater compartments which comply with paragraph (5) of AD–49–18–1 or FAA approved equivalent meet the requirements of §121.257 applicable to heater compartments if, in addition, a shutoff valve located above the main cabin floor level is installed in the alcohol supply line or lines between the alcohol supply tank and those alcohol pumps located under the main cabin floor. If all of the alcohol pumps are located above the main cabin floor, the alcohol shutoff valve need not be installed. In complying with paragraph (5) of AD–49–18–1, a fail-safe electric fuel shutoff valve may be used in lieu of the manually operated valve.

23. *Lines and fittings.*—(a) *Engine compartment.* C–46 engine compartments which comply with all applicable airworthiness directives, including AD–62–10–2, by using FAA approved fire-resistant lines, hoses, and end fittings, and engine compartments which meet the C–46 transport category requirements, meet the requirements of §121.259.

(b) *Combustion heater compartments* All lines, hoses, and end fittings, and couplings which carry fuel to the heaters and heater controls, must be of FAA approved fire-resistant construction.

24. *Vent and drain lines.*—(a) *Enginecompartment.* C–46 engine compartments meet the requirements of §121.261 if—

(1) The compartments conform to type design and comply with all applicable airworthiness directives or FAA approved equivalent; and

(2) Drain lines from supercharger case, engine-driven fuel pump, and engine-driven hydraulic pump reach into the scupper drain located in the lower cowling segment.

(b) *Combustion heater compartment.* C–46 heater compartments meet the requirements of §121.261 if they conform to AD–49–18–1 or FAA approved equivalent.

25. *Fire-extinguishing system.* (a) To meet the requirements of §121.263, C–46 airplanes must have installed fire extinguishing systems to serve all designated fire zones. The fire-extinguishing systems, the quantity of extinguishing agent, and the rate of discharge shall be such as to provide a minimum of one adequate discharge for each designated fire zone. Compliance with this provision requires the installation of a separate fire extinguisher for each engine compartment. Insofar as the engine compartment is concerned, the system shall be capable of protecting the entire compartment against the various types of fires likely to occur in the compartment.

(b) Fire-extinguishing systems which conform to the C–46 transport category requirements meet the requirements set forth in paragraph (a). Furthermore, fire-extinguishing systems for combustion heater compartments which conform to the requirements of AD–49–18–1 or an FAA approved equivalent also meet the requirements in paragraph (a).

In addition, a fire-extinguishing system for C–46 airplanes meets the adequacy requirement of paragraph (a) if it provides the same or equivalent protection to that demonstrated by the CAA in tests conducted in 1941 and 1942, using a CW–20 type engine nacelle (without diaphragm). These tests were conducted at the Bureau of Standards facilities in Washington, DC, and copies of the test reports are available through the FAA Regional Engineering Offices. In this connection, the flow rates and distribution of extinguishing agent substantiated in American Airmotive Report No. 128–52–d, FAA approved February 9, 1953, provides protection equivalent to that demonstrated by the CAA in the CW–20 tests. In evaluating any C–46 fire-extinguishing system with respect to the aforementioned CW–20 tests, the Administration would require data in a narrative form, utilizing drawings or photographs to show at least the following:

Installation of containers; installation and routing of plumbing; type, number, and location of outlets or nozzles; type, total volume, and distribution of extinguishing agent; length of time required for discharging; means for thermal relief, including type and location of discharge indicators; means of discharging, e.g., mechanical cutterheads, electric cartridge, or other method; and whether a one- or two-shot system is used; and if the latter is used, means of cross-feeding or otherwise selecting distribution of extinguishing agent; and types of materials used in makeup of plumbing.

High rate discharge (HRD) systems using agents such as bromotrifluoromethane, dibrodifluoromethane and chlorobromomethane (CB), may also meet the requirements of paragraph (a).

26. *Fire-extinguishing agents, Extinguishing agent container pressure relief, Extinguishing agent container compartment temperatures, and Fire-extinguishing system materials.* No change from the requirements of §§121.265 through 121.271.

27. *Fire-detector system.* Compliance with the requirements of §121.273 requires that C–46 fire detector systems conform to:

(a) AD–62–10–2 or FAA approved equivalent for engine compartments; and

(b) AD–49–18–1 or FAA approved equivalent for combustion heater compartments

28. *Fire detectors.* No change from the requirements of §121.275.

29. *Protection of other airplane components against fire.* To meet the requirements of §121.277, C–46 airplanes must—

(a) Conform to the type design and all applicable airworthiness directives; and

(b) Be modified or have operational procedures established to provide additional fire protection for the wheel well door aft of each engine compartment. Modifications may consist of improvements in sealing of the main landing gear wheel well doors. An operational procedure which is acceptable to the Agency is one requiring the landing gear control to be placed in the up position in case of in-flight engine fire. In accordance with §121.315, such procedure must be set forth in the emergency portion of the operator's emergency checklist pertaining to in-flight engine fire.

30. *Control of engine rotation.* C–46 propeller feathering systems which conform to the type design and all applicable airworthiness directives meet the requirements of §121.279.

31. *Fuel system independence.* C–46 fuel systems which conform to the type design and all applicable airworthiness directives meet the requirements of §121.281.

32. *Induction system ice prevention.* The C–46 carburetor anti-icing system which conforms to the type design and all applicable airworthiness directives meets the requirements of §121.283.

33. *Carriage of cargo in passenger compartments.* Section 121.285 is not applicable to nontransport category C–46 cargo airplanes.

34. *Carriage of cargo in cargo compartments.* A standard cargo loading and tiedown arrangement set forth in the operator's manual and found acceptable to the Administrator must be used in complying with §121.287.

35. *Performance data.* Performance data on Curtiss model C–46 airplane certificated for maximum weight of 45,000 and 48,000 pounds for cargo-only operations.

1. The following performance limitation data, applicable to the Curtiss model C–46 airplane for cargo-only operation, must be used in determining compliance with §§121.199 through 121.205. These data are presented in the tables and figures of this appendix.

TABLE 1—TAKEOFF LIMITATIONS

(a) Curtiss C–46 certificated for maximum weight of 45,000 pounds.

(1) *Effective length* of runway required when effective length is determined in accordance with §121.171 (distance to accelerate to 93 knots TIAS and stop, with zero wind and zero gradient). (Factor=1.00)

[Distance in feet]

Standard altitude in feet	Airplane weight in pounds		
	39,000	42,000	45,000 [1]
S.L	4,110	4,290	4,570
1,000	4,250	4,440	4,720
2,000	4,400	4,600	4,880
3,000	4,650	4,880	5,190
4,000	4,910	5,170	5,500
5,000	5,160	5,450	5,810
6,000	5,420	5,730	6,120
7,000	5,680	6,000	6,440
8,000	5,940	6,280	[1]

[1] Ref. Fig. 1(a)(1) for weight and distance for altitudes above 7,000′.

(2) Actual length of runway required when *effective length*, considering obstacles, is not determined (distance to accelerate to 93 knots TIAS and stop, divided by the factor 0.85).

[Distance in feet]

Standard altitude in feet	Airplane weight in pounds		
	39,000	42,000	45,000 [1]
S.L	4,830	5,050	5,370
1,000	5,000	5,230	5,550
2,000	5,170	5,410	5,740
3,000	5,470	5,740	6,100
4,000	5,770	6,080	6,470
5,000	6,070	6,410	6,830
6,000	6,380	6,740	7,200
7,000	6,680	7,070	7,570
8,000	6,990	7,410	[1]

[1] Ref. Fig. 1(a)(2) for weight and distance for altitudes above 7,000′.

(b) Curtiss C–46 certificated for maximum weight 48,000 pounds.

(1) *Effective length* of runway required when effective length is determined in accordance with §121.171 (distance to accelerate to 93 knots TIAS and stop, with zero wind and zero gradient). (Factor=1.00)

[Distance in feet]

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	48,000 [1]
S.L	4,110	4,290	4,570	4,950
1,000	4,250	4,440	4,720	5,130
2,000	4,400	4,600	4,880	5,300
3,000	4,650	4,880	5,190	5,670
4,000	4,910	5,170	5,500	6,050
5,000	5,160	5,450	5,810	6,420
6,000	5,420	5,730	6,120	6,800
7,000	5,680	6,000	6,440	[1]
8,000	5,940	6,280	6,750	[1]

[1] Ref. Fig. 1(b)(1) for weight and distance for altitudes above 6,000′.

(2) Actual length of runway required when *effective length*, considering obstacles, is not determined (distance to accelerate to 93 knots TIAS and stop, divided by the factor 0.85).

[Distance in feet]

Standard altitude in feet	Airplane weight in pounds			
	39,000	42,000	45,000	48,000 [1]
S.L	4,830	5,050	5,370	5,830
1,000	5,000	5,230	5,550	6,030
2,000	5,170	5,410	5,740	6,230
3,000	5,470	5,740	6,100	6,670
4,000	5,770	6,080	6,470	7,120
5,000	6,070	6,410	6,830	7,560
6,000	6,380	6,740	7,200	8,010
7,000	6,680	7,070	7,570	([1])
8,000	6,990	7,410	7,940	([1])

[1] Ref. Fig. 1(b)(2) for weight and distance for altitudes above 6,000′.

TABLE 2—EN ROUTE LIMITATIONS

(a) Curtiss model C–46 certificated for maximum weight of 45,000 pounds (based on a climb speed of 113 knots (TIAS)).

Weight (pounds)	Terrain clearance (feet) [1]	Blower setting
45,000	6,450	Low.
44,000	7,000	Do.
43,000	7,500	Do.
42,200	8,000	High.
41,000	9,600	Do.
40,000	11,000	Do.
39,000	12,300	Do.

[1] Highest altitude of terrain over which airplanes may be operated in compliance with §121.201.
Ref. Fig. 2(a).

(b) Curtiss model C–46 certificated for maximum weight of 48,000 pounds or with engine installation approved for 2,550 revolutions per minute (1,700 brake horsepower). Maximum continuous power in low blower (based on a climb speed of 113 knots (TIAS)).

Weight (pounds)	Terrain clearance (feet) [1]	Blower setting
48,000	5,850	Low.
47,000	6,300	Do.
46,000	6,700	Do.
45,000	7,200	Do.
44,500	7,450	Do.
44,250	8,000	High.
44,000	8,550	Do.
43,000	10,800	Do.
42,000	12,500	Do.
41,000	13,000	Do.

[1] Highest altitude of terrain over which airplanes may be operated in compliance with §121.201.
Ref. Fig. 2(b).

TABLE 3—LANDING LIMITATIONS

(a) Intended Destination.

Effective length of runway required for intended destination when effective length is determined in accordance with §121.171 with zero wind and zero gradient.

(1) Curtiss model C–46 certificated for maximum weight of 45,000 pounds. (0.60 factor)

Distance in feet

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in knots							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
S.L	4,320	86	4,500	88	4,700	90	4,800	91
1,000	4,440	86	4,620	88	4,830	90	4,930	91
2,000	4,550	86	4,750	88	4,960	90	5,050	91
3,000	4,670	86	4,880	88	5,090	90	5,190	91
4,000	4,800	86	5,000	88	5,220	90	5,320	91
5,000	4,920	86	5,140	88	5,360	90	5,460	91
6,000	5,040	86	5,270	88	5,550	90	5,600	91
7,000	5,170	86	5,410	88	5,650	90	5,750	91
8,000	5,310	86	5,550	88	5,800	90	5,900	91

[1] Steady approach speed through 50–foot height TIAS denoted by symbol V_{50}.
Ref. Fig. 3(a)(1).

(2) Curtiss model C–46 certificated for maximum weight of 48,000 pounds.[1] (0.60 factor.)

Distance in feet

Standard altitude in feet	Airplane weight in pounds and approach speeds [2] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	43,000	V_{50}
S.L	3,370	80	3,490	82	3,620	84	3,740	86
1,000	3,460	80	3,580	82	3,710	84	3,830	86
2,000	3,540	80	3,670	82	3,800	84	3,920	86
3,000	3,630	80	3,760	82	3,890	84	4,020	86
4,000	3,720	80	3,850	82	3,980	84	4,110	86
5,000	3,800	80	3,940	82	4,080	84	4,220	86
6,000	3,890	80	4,040	82	4,180	84	4,320	86

Distance in feet

Standard altitude in feet	Airplane weight in pounds and approach speeds[2] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	43,000	V_{50}
7,000	3,980	80	4,140	82	4,280	84	4,440	86
8,000	4,080	80	4,240	82	4,390	84	4,550	86

[1] For use with Curtiss model C–46 airplanes when approved for this weight.
[2] Steady approach speed through 50 height knots TIAS denoted by symbol V_{50}3.
Ref. Fig. 3(a)(2).

(b) Alternate Airports.

Effective length of runway required when effective length is determined in accordance with §121.171 with zero wind and zero gradient.

(1) Curtiss model C–46 certificated for maximum weight of 45,000 pounds. (0.70 factor.)

Distance in feet

Standard altitude in feet	Airplane weight in pounds and approach speeds[1] in knots							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
S.L	3,700	86	3,860	88	4,030	90	4,110	91
1,000	3,800	86	3,960	88	4,140	90	4,220	91
2,000	3,900	86	4,070	88	4,250	90	4,340	91
3,000	4,000	86	4,180	88	4,360	90	4,450	91
4,000	4,110	86	4,290	88	4,470	90	4,560	91
5,000	4,210	86	4,400	88	4,590	90	4,680	91
6,000	4,330	86	4,510	88	4,710	90	4,800	91
7,000	4,430	86	4,630	88	4,840	90	4,930	91
8,000	4,550	86	4,750	88	4,970	90	5,060	91

[1] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.
Ref. Fig. 3(b)(1).

(2) Curtiss model C–46 certificated for maximum weight of 48,000 pounds.[1] (0.70 factor.)

Distance in feet

Standard altitude in feet	Airplane weight in pounds and approach speeds[2] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
S.L	2,890	80	3,000	82	3,110	84	3,220	86
1,000	2,960	80	3,070	82	3,180	84	3,280	86
2,000	3,040	80	3,150	82	3,260	84	3,360	86
3,000	3,110	80	3,220	82	3,340	84	3,440	86
4,000	3,180	80	3,300	82	3,410	84	3,520	86
5,000	3,260	80	3,380	82	3,500	84	3,610	86
6,000	3,330	80	3,460	82	3,580	84	3,700	86
7,000	3,420	80	3,540	82	3,670	84	3,800	86
8,000	3,500	80	3,630	82	3,760	84	3,900	86

[1] For use with Curtiss model C–46 airplanes when approved for this weight.
[2] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.
Ref. Fig. 3(b)(2).

(c) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with §121.171.

(1) Curtiss model C–46 certificated for maximum weight of 45,000 pounds. (0.55 factor.)

Distance in feet

Standard altitude in feet	Airplane weight in pounds and approach speeds[1] in knots							
	40,000	V_{50}	42,000	V_{50}	44,000	V_{50}	45,000	V_{50}
S.L	4,710	86	4,910	88	5,130	90	5,230	91
1,000	4,840	86	5,050	88	5,270	90	5,370	91
2,000	4,960	86	5,180	88	5,410	90	5,510	91
3,000	5,090	86	5,320	88	5,550	90	5,660	91
4,000	5,230	86	5,460	88	5,700	90	5,810	91
5,000	5,360	86	5,600	88	5,850	90	5,960	91
6,000	5,500	86	5,740	88	6,000	90	6,110	91
7,000	5,640	86	5,900	88	6,170	90	6,280	91
8,000	5,790	86	6,050	88	6,340	90	6,450	91

[1] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.
Ref. Fig. 3(c)(1).

(2) Curtiss C–46 certificated for maximum weight of 48,000 pounds.[1] (0.55 factor.)

Distance in feet

Standard altitude in feet	Airplane weight in pounds and approach speeds[2] in knots							
	42,000	V_{50}	44,000	V_{50}	46,000	V_{50}	48,000	V_{50}
S.L	3,680	80	3,820	82	3,960	84	4,090	86
1,000	3,770	80	3,910	82	4,050	84	4,180	86
2,000	3,860	80	4,000	82	4,140	84	4,280	86
3,000	3,960	80	4,090	82	4,240	84	4,380	86
4,000	4,050	80	4,190	82	4,340	84	4,490	86
5,000	4,150	80	4,290	82	4,450	84	4,600	86
6,000	4,240	80	4,400	82	4,560	84	4,710	86
7,000	4,350	80	4,510	82	4,670	84	4,840	86
8,000	4,450	80	4,620	82	4,790	84	4,960	86

[1] For use with Curtiss model C–46 airplanes when approved for this weight.
[2] Steady approach speed through 50 foot-height-knots TIAS denoted by symbol V_{50}.
Ref. Fig. 3(c)(2).

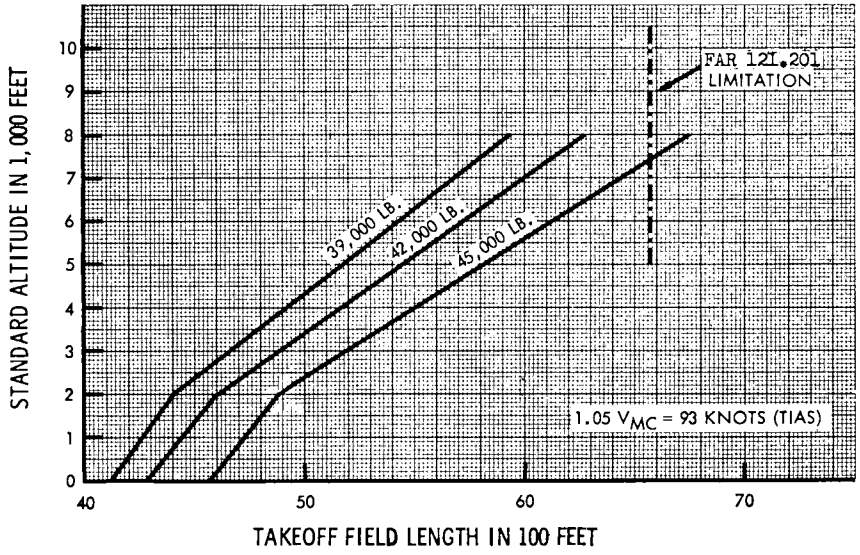
CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 45,000 LBS.

TAKEOFF LIMITATION.
ZERO WIND AND ZERO GRADIENT.

BASED ON EFFECTIVE TAKEOFF LENGTH. (1.00 FACTOR)

FAR 121.199



REFERENCE TABLE 1(a) (1)

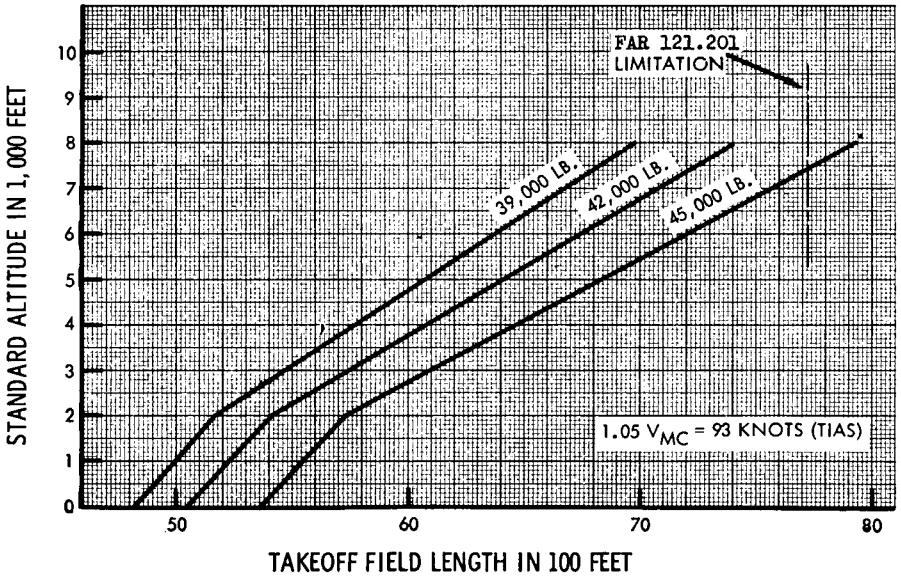
FIG. 1 (a)(1)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 45,000 LBS.

TAKEOFF LIMITATION
ZERO WIND AND ZERO GRADIENT

BASED ON ACTUAL TAKEOFF LENGTH
WHEN EFFECTIVE LENGTH IS NOT
DETERMINED. (0.85 FACTOR)



REFERENCE TABLE 1 (a) (2) FIG. 1(a) (2)

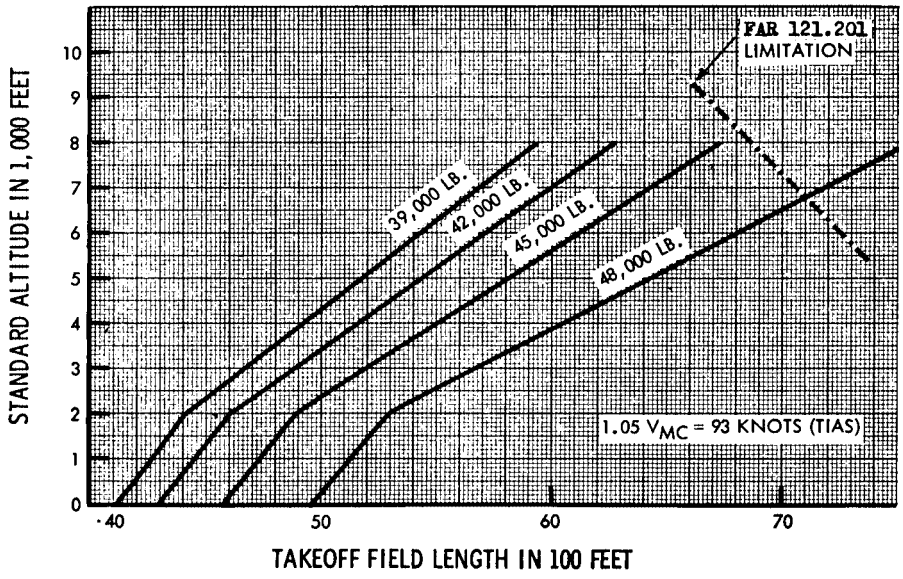
CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 48,000 LBS.

TAKEOFF LIMITATION
ZERO WIND AND ZERO GRADIENT

BASED ON EFFECTIVE TAKEOFF LENGTH. (1.00 FACTOR)

FAR 121.199



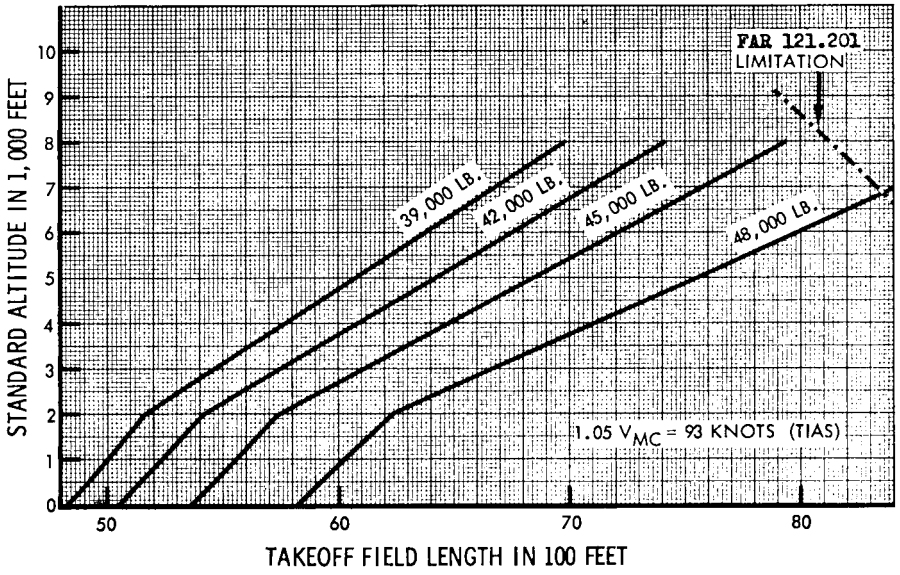
REFERENCE TABLE 1(b) (1) FIG. 1(b) (1)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 48,000 LBS.

TAKEOFF LIMITATION
ZERO WIND AND ZERO GRADIENT

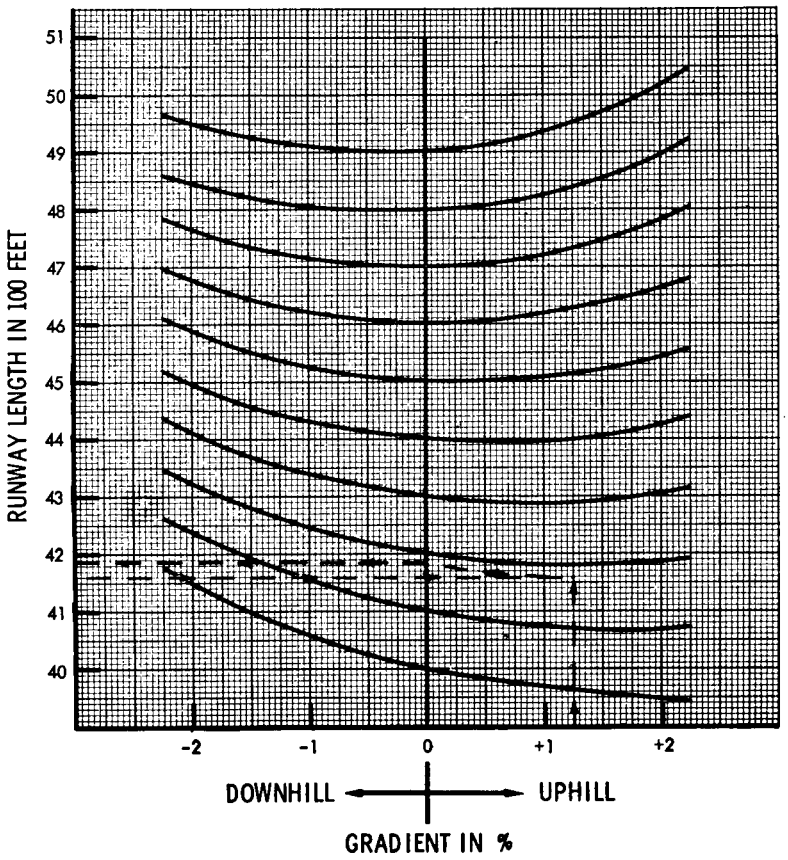
BASED ON ACTUAL TAKEOFF LENGTH
WHEN EFFECTIVE LENGTH IS NOT
DETERMINED. (0.85 FACTOR)



REFERENCE TABLE 1(b) (2) FIG. 1(b) (2)

RUNWAY GRADIENT CORRECTION
FOR ACCELERATE - STOP DISTANCE

FOR C-46 AIRPLANES UNDER FAR 121.199



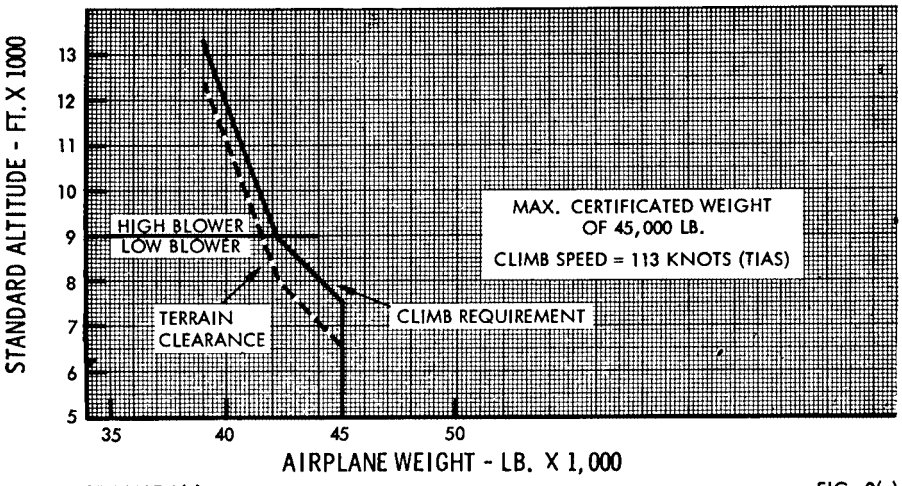
1-27-64

FIG. 1(c)

CURTISS C-46 MODELS

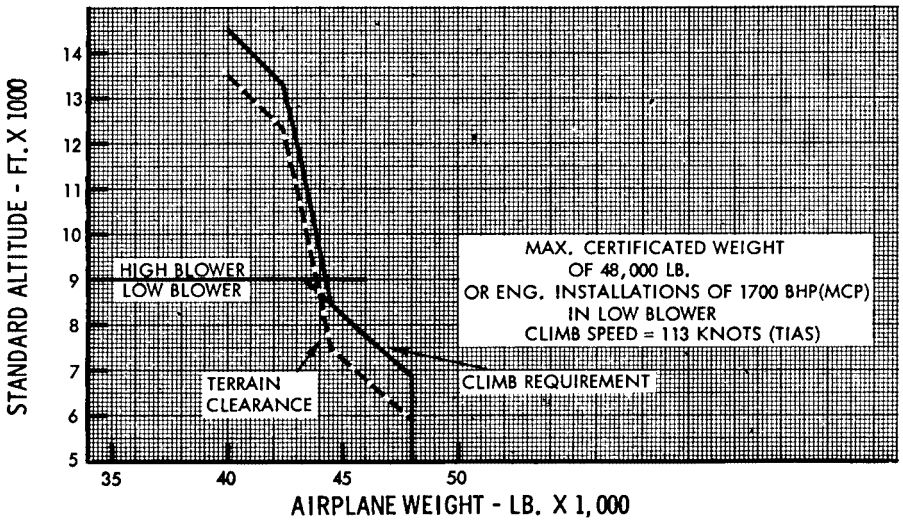
ENROUTE LIMITATIONS - ONE ENGINE INOPERATIVE

FAR 121.201



REFERENCE TABLE 2(a)

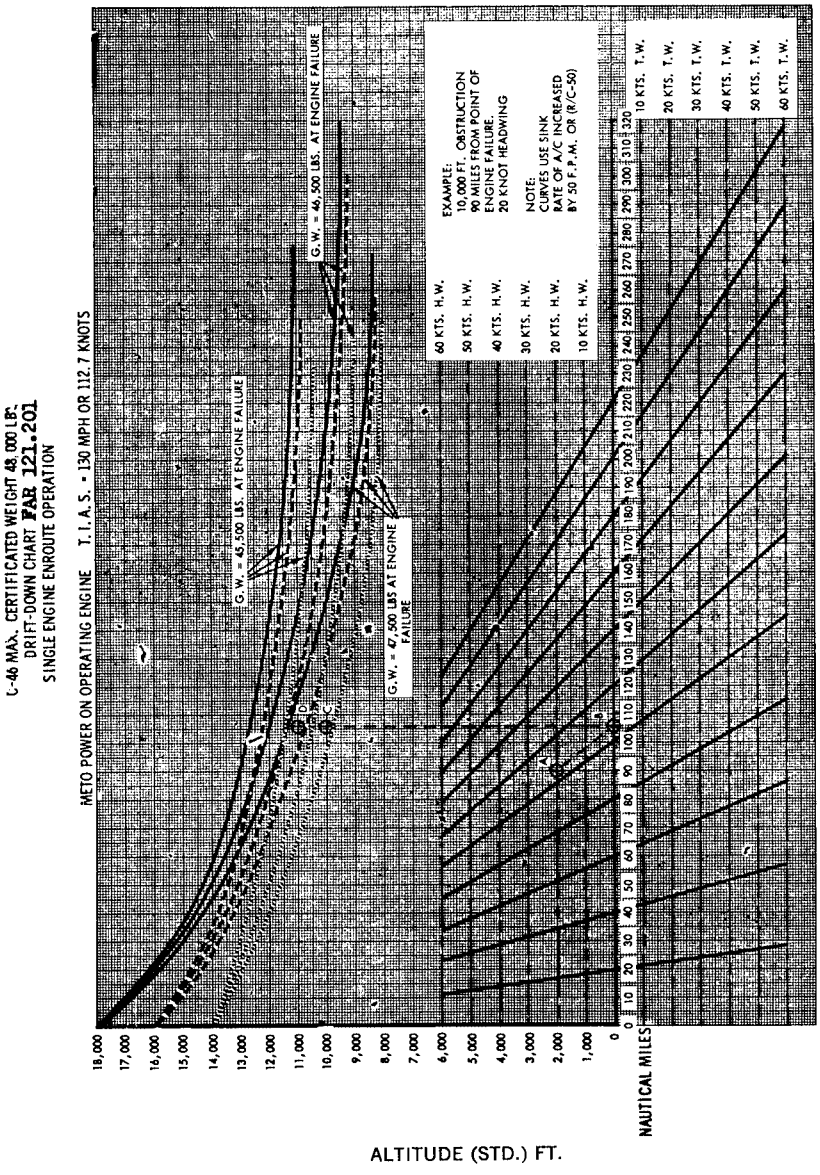
FIG. 2(a)



REFERENCE TABLE 2(b)

FIG. 2(b)

FIG. 2B3


C-46 MAX. CERTIFICATED WEIGHT 48,000 LBS.
DRIFT-DOWN CHART FAR 121.201
SINGLE ENGINE ENROUTE OPERATION
METO POWER ON OPERATING ENGINE T. I. A. S. - 130 MPH OR 112.7 KNOTS
G.W. = 46,500 LBS. AT ENGINE FAILURE
G.W. = 47,500 LBS. AT ENGINE FAILURE
60 KTS. H.W.
50 KTS. H.W.
40 KTS. H.W.
30 KTS. H.W.
20 KTS. H.W.
10 KTS. H.W.
EXAMPLE:
10,000 FT. OBSTRUCTION
90 MILES FROM POINT OF ENGINE FAILURE
20 KNOT HEADWIND
NOTE:
CURVES USE SINK RATE OF A/C INCREASED BY 50 F.P.M. OR (R/C-50)
10 KTS. T.W.
20 KTS. T.W.
30 KTS. T.W.
40 KTS. T.W.
50 KTS. T.W.
60 KTS. T.W.
ALTITUDE (STD.) FT.
NAUTICAL MILES

C-46 MAX. CERTIFICATED WEIGHT 48,000 LBS.
ENROUTE CLIMB SUMMARY

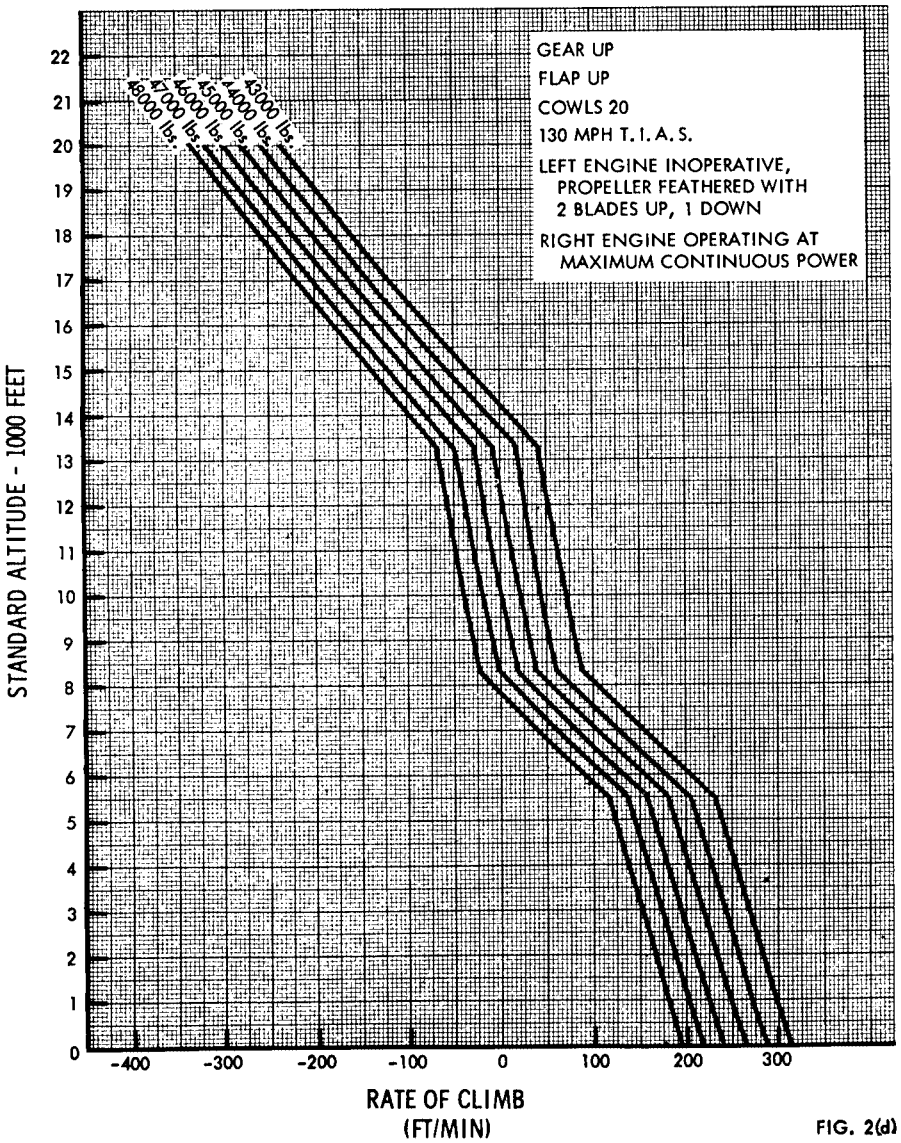


FIG. 2(d)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 45,000 LBS.

LANDING LIMITATIONS.
ZERO WIND AND ZERO GRADIENT

BASED ON EFFECTIVE LANDING LENGTH
AT INTENDED DESTINATION. (0.60 FACTOR)

FAR 121.203

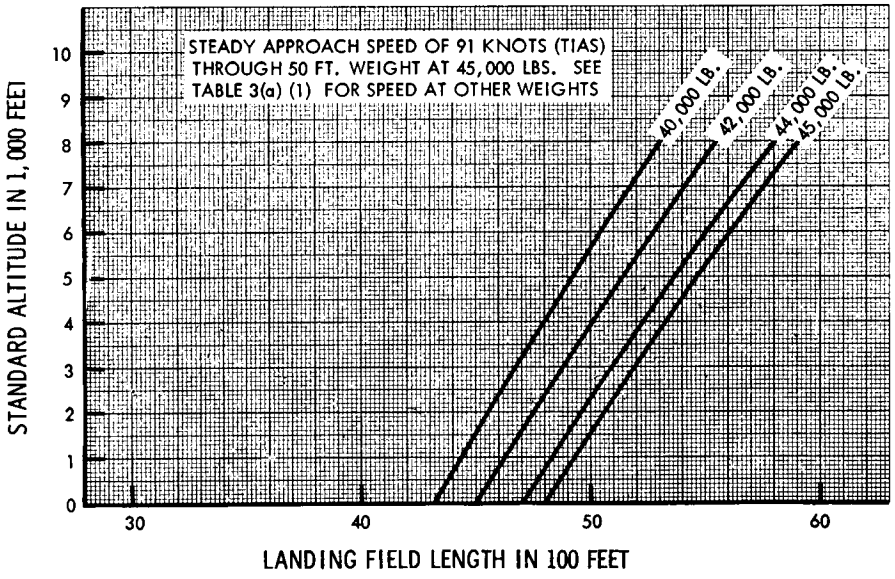


FIG. 3(a) (1)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 48,000 LBS.

LANDING LIMITATIONS.
ZERO WIND AND ZERO GRADIENT

BASED ON EFFECTIVE LANDING LENGTH
AT INTENDED DESTINATION. (0.60 FACTOR)

FAR 121.203

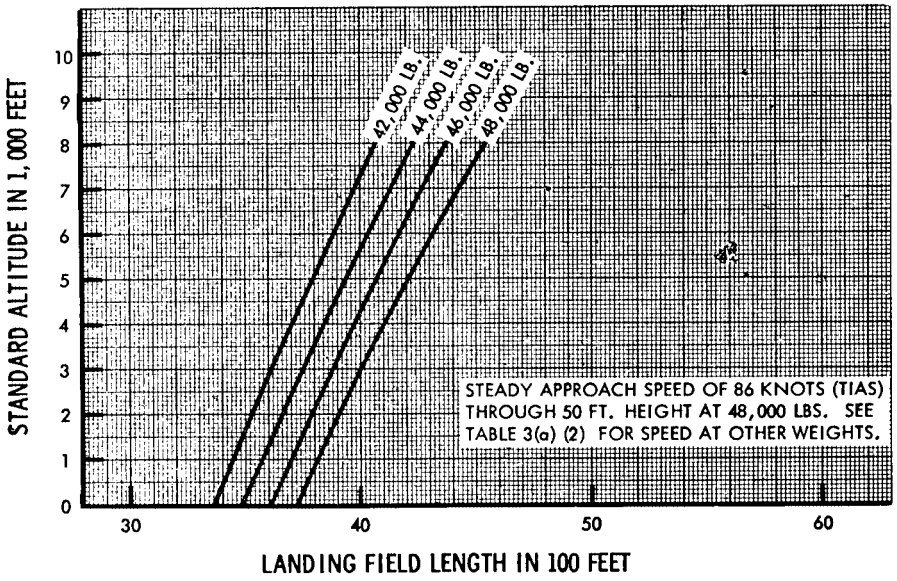


FIG. 3(a) (2)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 45,000 LBS.

LANDING LIMITATIONS.
ZERO WIND AND ZERO GRADIENT

BASED ON EFFECTIVE LANDING LENGTH
AT ALTERNATE AIRPORTS. (0.70 FACTOR).

FAR 121.205

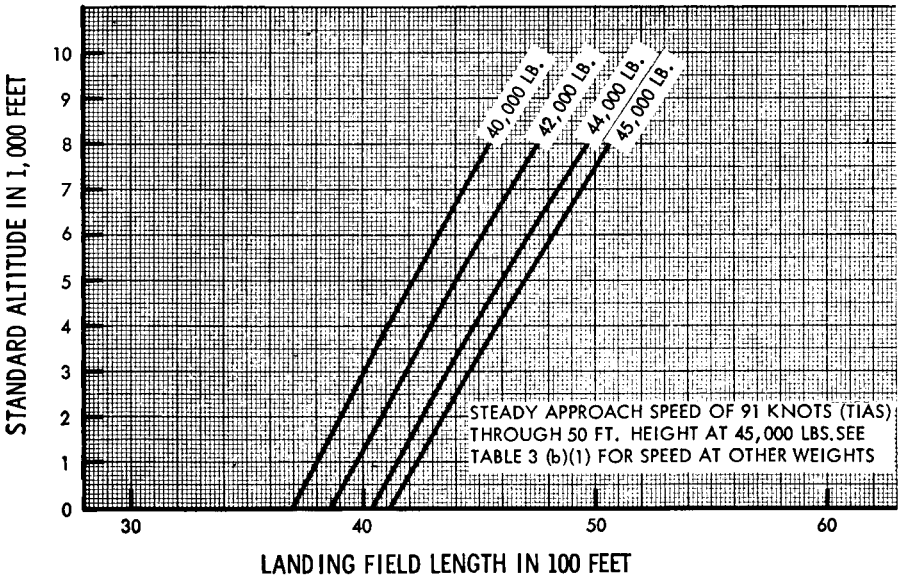


FIG. 3(b) (1)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 48,000 LBS.

LANDING LIMITATIONS.
ZERO WIND AND ZERO GRADIENT

BASED ON EFFECTIVE LANDING LENGTH
AT ALTERNATE AIRPORTS. (0.70 FACTOR).

FAR 121.205

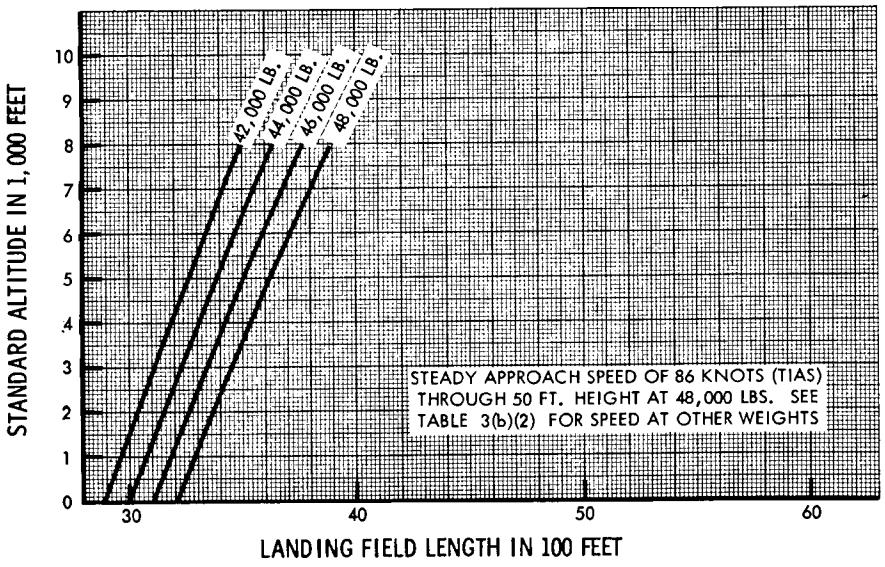


FIG. 3(b) (2)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 45,000 LBS.

LANDING LIMITATIONS.
ZERO WIND AND ZERO GRADIENT

BASED ON ACTUAL LANDING LENGTH
WHEN EFFECTIVE LENGTH IS NOT
DETERMINED. (0.55 FACTOR)

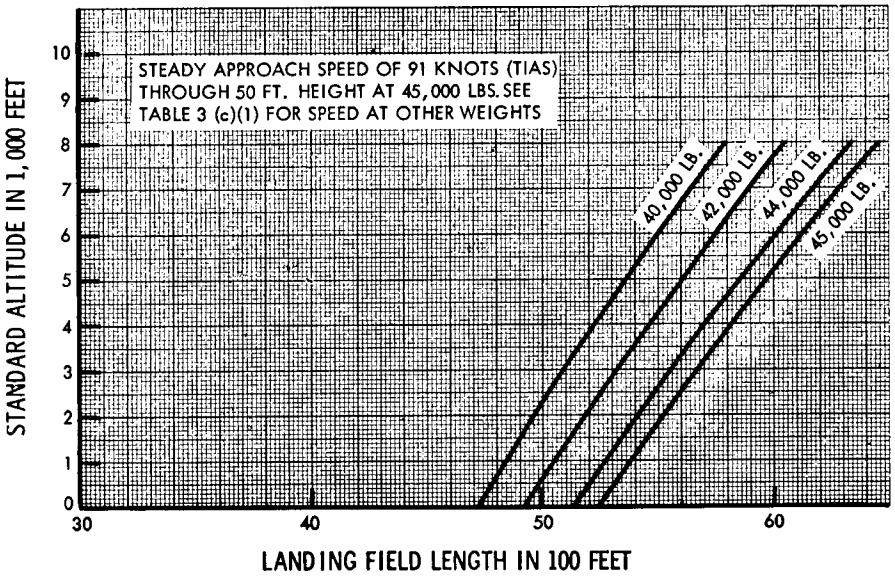


FIG. 3(c) (1)

CURTISS C-46 MODELS

CERTIFICATED FOR MAX. WEIGHT OF 48,000 LBS.

LANDING LIMITATIONS,
ZERO WIND AND ZERO GRADIENT

BASED ON ACTUAL LANDING LENGTH
WHEN EFFECTIVE LENGTH IS NOT
DETERMINED. (0.55 FACTOR)

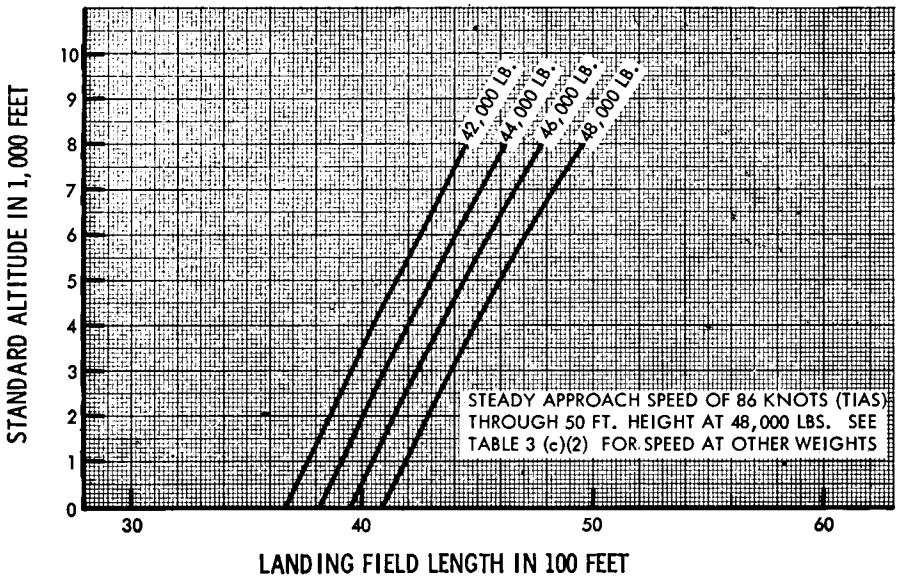


FIG. 3(c) (2)

[Doc. No. 4080, 30 FR 258, Jan. 3, 1965; 30 FR 481, Jan. 14, 1965, as amended by Amdt. 121–207, 54 FR 39293, Sept. 25, 1989]

APPENDIX D TO PART 121—CRITERIA FOR DEMONSTRATION OF EMERGENCY EVACUATION PROCEDURES UNDER § 121.291

(a) *Aborted takeoff demonstration.*

(1) The demonstration must be conducted either during the dark of the night or during daylight with the dark of the night simulated. If the demonstration is conducted indoors during daylight hours, it must be conducted with each window covered and each door closed to minimize the daylight effect. Illumination on the floor or ground may be used, but it must be kept low and shielded against shining into the airplane's windows or doors.

(2) The airplane must be a normal ground attitude with landing gear extended.

(3) Unless the airplane is equipped with an off-wing descent means, stands or ramps may be used for descent from the wing to the ground. Safety equipment such as mats or inverted life rafts may be placed on the floor or ground to protect participants. No other equipment that is not part of the emergency evacuation equipment of the airplane may be used to aid the participants in reaching the ground.

(4) The airplane's normal electrical power sources must be deenergized.

(5) All emergency equipment for the type of passenger-carrying operation involved must be installed in accordance with the certificate holder's manual.

(6) Each external door and exit, and each internal door or curtain must be in position to simulate a normal takeoff.

(7) A representative passenger load of persons in normal health must be used. At least 40 percent of the passenger load must be females. At least 35 percent of the passenger load must be over 50 years of age. At least 15 percent of the passenger load must be female and over 50 year of age. Three life-size dolls, not included as part of the total passenger load, must be carried by passengers to simulate live infants 2 years old or younger. Crewmembers, mechanics, and training personnel, who maintain or operate the airplane in the normal course of their duties, may not be used as passengers.

(8) No passenger may be assigned a specific seat except as the Administrator may require. Except as required by item (12) of this paragraph, no employee of the certificate holder may be seated next to an emergency exit.

(9) Seat belts and shoulder harnesses (as required) must be fastened.

(10) Before the start of the demonstration, approximately one-half of the total average amount of carry-on baggage, blankets, pillows, and other similar articles must be distributed at several locations in the aisles and emergency exit access ways to create minor obstructions.

(11) The seating density and arrangement of the airplane must be representative of the highest capacity passenger version of that airplane the certificate holder operates or proposes to operate.

(12) Each crewmember must be a member of a regularly scheduled line crew, except that flight crewmembers need not be members of a regularly scheduled line crew, provided they have knowledge of the airplane. Each crewmember must be seated in the seat the crewmember is normally assigned for takeoff, and must remain in that seat until the signal for commencement of the demonstration is received.

(13) No crewmember or passenger may be given prior knowledge of the emergency exits available for the demonstration.

(14) The certificate holder may not practice, rehearse, or describe the demonstration for the participants nor may any participant have taken part in this type of demonstration within the preceding 6 months.

(15) The pretakeoff passenger briefing required by § 121.571 may be given in accordance with the certificate holder's manual. The passengers may also be warned to follow directions of crewmembers, but may not be instructed on the procedures to be followed in the demonstration.

(16) If safety equipment as allowed by item (3) of this section is provided, either all passenger and cockpit windows must be blacked out or all of the emergency exits must have safety equipment in order to prevent disclosure of the available emergency exits.

(17) Not more than 50 percent of the emergency exits in the sides of the fuselage of an airplane that meet all of the requirements applicable to the required emergency exits for that airplane may be used for the demonstration. Exits that are not to be used in the demonstration must have the exit handle deactivated or must be indicated by red lights, red tape, or other acceptable means, placed outside the exits to indicate fire or other reason that they are unusable. The exits to be used must be representative of all of the emergency exits on the airplane and must be designated by the certificate holder, subject to approval by the Administrator. At least one floor level exit must be used.

(18) Except as provided in paragraph (a)(3) of this appendix, all evacuees must leave the airplane by a means provided as part of the airplane's equipment.

(19) The certificate holder's approved procedures and all of the emergency equipment that is normally available, including slides, ropes, lights, and megaphones, must be fully utilized during the demonstration, except that the flightcrew must take no active role in assisting others inside the cabin during the demonstration.

(20) The evacuation time period is completed when the last occupant has evacuated the airplane and is on the ground. Evacuees

using stands or ramps allowed by item (3) above are considered to be on the ground when they are on the stand or ramp: *Provided*, That the acceptance rate of the stand or ramp is no greater than the acceptance rate of the means available on the airplane for descent from the wing during an actual crash situation.

(b) *Ditching demonstration.* The demonstration must assume that daylight hours exist outside the airplane, and that all required crewmembers are available for the demonstration.

(1) If the certificate holder's manual requires the use of passengers to assist in the launching of liferafts, the needed passengers must be aboard the airplane and participate in the demonstration according to the manual.

(2) A stand must be placed at each emergency exit and wing, with the top of the platform at a height simulating the water level of the airplane following a ditching.

(3) After the ditching signal has been received, each evacuee must don a life vest according to the certificate holder's manual.

(4) Each liferaft must be launched and inflated, according to the certificate holder's manual, and all other required emergency equipment must be placed in rafts.

(5) Each evacuee must enter a liferaft, and the crewmembers assigned to each liferaft must indicate the location of emergency equipment aboard the raft and describe its use.

(6) Either the airplane, a mockup of the airplane or a floating device simulating a passenger compartment must be used.

(i) If a mockup of the airplane is used, it must be a life-size mockup of the interior and representative of the airplane currently used by or proposed to be used by the certificate holder, and must contain adequate seats for use of the evacuees. Operation of the emergency exits and the doors must closely simulate those on the airplane. Sufficient wing area must be installed outside the over-the-wing exits to demonstrate the evacuation.

(ii) If a floating device simulating a passenger compartment is used, it must be representative, to the extent possible, of the passenger compartment of the airplane used in operations. Operation of the emergency exits and the doors must closely simulate operation on that airplane. Sufficient wing area must be installed outside the over-the-wing exits to demonstrate the evacuation. The device must be equipped with the same survival equipment as is installed on the airplane, to accommodate all persons participating in the demonstration.

[Doc. No. 2033, 30 FR 3206, Mar. 9, 1965, as amended by Amdt. 121–30, 32 FR 13268, Sept. 20, 1967; Amdt. 121–41, 33 FR 9067, June 20, 1968; Amdt. 121–46, 34 FR 5545, Mar. 22, 1969; Amdt. 121–47, 34 FR 11489, July 11, 1969; Amdt. 121–233, 58 FR 45230, Aug. 26, 1993]

APPENDIX E TO PART 121—FLIGHT TRAINING REQUIREMENTS

The maneuvers and procedures required by §121.424 of this part for pilot initial, transition, and upgrade flight training are set forth in the certificate holder's approved low-altitude windshear flight training program and in this appendix and must be performed inflight except that windshear maneuvers and procedures must be performed in an airplane simulator in which the maneuvers and procedures are specifically authorized to be accomplished and except to the extent that certain other maneuvers and procedures may be performed in an airplane simulator with a visual system (visual simulator), an airplane simulator without a visual system (nonvisual simulator), a training device, or a static airplane as indicated by the appropriate symbol in the respective column opposite the maneuver or procedure.

Whenever a maneuver or procedure is authorized to be performed in a nonvisual simulator, it may be performed in a visual simulator; when authorized in a training device, it may be performed in a visual or nonvisual simulator, and in some cases, a static airplane. Whenever the requirement may be performed in either a training device or a static airplane, the appropriate symbols are entered in the respective columns.

For the purpose of this appendix, the following symbols mean—

P=Pilot in Command (PIC).

S=Second in Command (SIC).

B=PIC and SIC.

F=Flight Engineer.

PJ=PIC transition Jet to Jet.

PP=PIC transition Prop. to Prop.

SJ=SIC transition Jet to Jet.

SP=SIC transition Prop. to Prop.

AT=All transition categories (PJ, PP, SJ, SP).

PS=SIC upgrading to PIC (same airplane).

SF=Flight Engineer upgrading to SIC (same airplane).

BU=Both SIC and Flight Engineer upgrading (same airplane).

FLIGHT TRAINING REQUIREMENTS

Maneuvers/Procedures	Initial training					Transition training					Upgrade training				
	A/P		Simulator			A/P		Simulator			A/P		Simulator		
	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device
As appropriate to the airplane and the operation involved, flight training for pilots must include the following maneuvers and procedures..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
I. Preflight:															
(a) Visual inspection of the exterior and interior of the airplane, the location of each item to be inspected, and the purpose for inspecting it. If a flight engineer is a required crewmember for the particular type of airplane, the visual inspection may be replaced by using an approved pictorial means that realistically portrays the location and detain of preflight inspection items..	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	
(b) Use of the prestart check list, appropriate control system checks, starting procedures, radio and electronic equipment checks, and the selection of proper navigation and communications radio facilities and frequencies prior to flight.	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(c) Taxiing, sailing, and docking procedures in compliance with instructions issued by the appropriate Traffic Control Authority or by the person conducting the training.	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	
(d) Pretakeoff checks that include powerplant checks.	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
II. Takeoffs:															
(a) Normal takeoffs which, for the purpose of this maneuver, begin when the airplane is taxied into position on the runway to be used.	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	
(b) Takeoffs with instrument conditions simulated at or before reaching an altitude of 100′ above the airport elevation.	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
(c) Crosswind takeoffs	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	
(d) Takeoffs with a simulated failure of the most critical powerplant—.	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	

FLIGHT TRAINING REQUIREMENTS—Continued

Maneuvers/Procedures	Initial training					Transition training					Upgrade training				
	A/P		Simulator			A/P		Simulator			A/P		Simulator		
	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device
(1) At a point after V_1 and before V_2 that in the judgment of the person conducting the training is appropriate to the airplane type under the prevailing conditions; or.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(2) At a point as close as possible after V_1 when V_1 and V_2 or V_1 and V_R are identical; or.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(3) At the appropriate speed for non-transport category airplanes.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
For transition training in an airplane group with engines mounted in similar positions, or from wing-mounted engines to aft fuselage-mounted engines, the maneuver may be performed in a nonvisual simulator.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(e) Rejected takeoffs accomplished during a normal takeoff run after reaching a reasonable speed determined by giving due consideration to aircraft characteristics, runway length, surface conditions, wind direction and velocity, brake heat energy, and any other pertinent factors that may adversely affect safety or the airplane.	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
Training in at least one of the above takeoffs must be accomplished at night. For transitioning pilots this requirement may be met during the operating experience required under §121.434 of this part by performing a normal takeoff at night when a check airman serving as pilot-in-command is occupying a pilot station.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
III. Flight Maneuvers and Procedures:															
(a) Turns with and without spoilers	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(b) Tuck and Mach buffet	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(c) Maximum endurance and maximum range procedures.	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(d) Operation of systems and controls at the flight engineer station.	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	PS	
(e) Runway and jammed stabilizer	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	

(f) Normal and abnormal or alternate operation of the following systems and procedures:															
(1) Pressurization					B					AT					BU
(2) Pneumatic					B					AT					BU
(3) Air conditioning					B					AT					BU
(4) Fuel and oil		B			B		AT			AT		BU			BU
(5) Electrical		B			B		AT			AT		BU			BU
(6) Hydraulic		B			B		AT			AT		BU			BU
(7) Flight control		B			B		AT					BU			BU
(8) Anti-icing and deicing				B					AT					BU	
(9) Auto-pilot				B					AT					BU	
(10) Automatic or other approach aids	B			B					AT		SF			BU	
(11) Stall warning devices, stall avoidance devices, and stability augmentation devices.	B			B					AT		SF			BU	
(12) Airborne radar devices				B					AT					BU	
(13) Any other systems, devices, or aids available.				B					AT					BU	
(14) Electrical, hydraulic, flight control, and flight instrument system malfunctioning or failure.		B			B		AT			AT		BU			BU
(15) Landing gear and flap systems failure or malfunction.		B			B		AT			AT		BU			BU
(16) Failure of navigation or communications equipment.				B					AT					BU	
(g) Flight emergency procedures that include at least the following:															
(1) Powerplant, heater, cargo compartment, cabin, flight deck, wing, and electrical fires.		B			B		AT			AT		BU			BU
(2) Smoke control		B			B		AT			AT		BU		BU	BU
(3) Powerplant failures				B					AT						BU
(4) Fuel jettisoning		B			B		B			B		BU			BU
(5) Any other emergency procedures outlined in the appropriate flight manual.				B					AT					BU	
(h) Steep turns in each direction. Each steep turn must involve a bank angle of 45° with a heading change of at least 180° but not more than 360°.				P					PJ					PS	
(i) Approaches to stalls in the takeoff configuration (except where the airplane uses only a zero-flap configuration), in the clean configuration, and in the landing configuration.				B					AT					BU	
Training in at least one of the above configurations must be accomplished while in a turn with a bank angle between 15° and 30°.															

FLIGHT TRAINING REQUIREMENTS—Continued

Maneuvers/Procedures	Initial training					Transition training					Upgrade training				
	A/P		Simulator			A/P		Simulator			A/P		Simulator		
	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device
(j) Recovery from specific flight characteristics that are peculiar to the airplane type.	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(k) Instrument procedures that include the following:															
(1) Area departure and arrival	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(2) Use of navigation systems including adherence to assigned radials.	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(3) Holding	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	
(l) ILS instrument approaches that include the following:															
(1) Normal ILS approaches	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	
(2) Manually controlled ILS approaches with a simulated failure of one powerplane which occurs before initiating the final approach course and continues to touchdown or through the missed approach procedure.	B	.....	.....	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
(m) Instrument approaches and missed approaches other than ILS which include the following:															
(1) Nonprecision approaches that the trainee is likely to use.	.....	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	BU	.....	
(2) In addition to subparagraph (1) of this paragraph, at least one other nonprecision approach and missed approach procedure that the trainee is likely to use.	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
In connection with paragraphs III(k) and III(l), each instrument approach must be performed according to any procedures and limitations approved for the approach facility used. The instrument approach begins when the airplane is over the initial approach fix for the approach procedure being used (or turned over to the final approach controller in the case of GCA approach) and ends when the airplane touches down on the runway or when transition to a missed approach configuration is completed.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

(n) Circling approaches which include the following:	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	
(1) That portion of the circling approach to the authorized minimum altitude for the procedure being used must be made under simulated instrument conditions.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(2) The circling approach must be made to the authorized minimum circling approach altitude followed by a change in heading and the necessary maneuvering (by visual reference) to maintain a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(3) The circling approach must be performed without excessive maneuvering, and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30°.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Training in the circling approach maneuver is not required for a pilot employed by a certificate holder subject to the operating rules of Part 121 of this chapter if the certificate holder's manual prohibits a circling approach in weather conditions below 1000–3 (ceiling and visibility); for a SIC if the certificate holder's manual prohibits the SIC from performing a circling approach in operations under this part.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(o) Zero-flap approaches. Training in this maneuver is not required for a particular airplane type if the Administrator has determined that the probability of flap extension failure on that type airplane is extremely remote due to system design. In making this determination, the Administrator determines whether training on slats only and partial flap approaches is necessary.	P	.....	.....	.....	.....	.....	.....	PP, PJ.	.....	.....	.....	.....	PS	.....	
(p) Missed approaches which include the following:															
(1) Missed approaches from ILS approaches.	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
(2) Other missed approaches	.....	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU
(3) Missed approaches that include a complete approved missed approach procedure.	.....	.....	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU

FLIGHT TRAINING REQUIREMENTS—Continued

Maneuvers/Procedures	Initial training					Transition training					Upgrade training				
	A/P		Simulator			A/P		Simulator			A/P		Simulator		
	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device	Inflight	Static	Visual simulator	Non-visual simulator	Training device
(4) Missed approaches that include a powerplant failure.	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
IV. Landings and Approaches to Landings:															
(a) Normal landings	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	
(b) Landing and go around with the horizontal stabilizer out of trim.	P	.....	.....	.....	.....	.....	.....	PJ, PP.	.....	.....	.....	.....	.....	.....	PS
(c) Landing in sequence from an ILS instrument approach.	B	.....	.....	.....	.....	AT	.....	AT	.....	.....	.....	.....	BU	.....	
(d) Cross wind landing	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	
(e) Maneuvering to a landing with simulated powerplant failure, as follows:															
(1) Except as provided in subparagraph (3) of this paragraph in the case of 3–engine airplanes, maneuvering to a landing with an approved procedure that approximates the loss of two powerplants (center and one outboard engine).	P	.....	.....	.....	.....	.....	.....	PJ, PP.	.....	.....	.....	.....	PS	.....	
(2) Except as provided in subparagraph (3) of this paragraph, in the case of other multiengine airplanes, maneuvering to a landing with a simulated failure of 50 percent of available powerplants with the simulated loss of power on one side of the airplane.	P	.....	.....	.....	.....	.....	.....	PJ, PP.	.....	.....	.....	.....	PS	.....	
(3) Notwithstanding the requirements of subparagraphs (1) and (2) of this paragraph, flight crewmembers who satisfy those requirements in a visual simulator must also:															
(*i*) Take inflight training in one-engine inoperative landings; and.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

(*ii*) In the case of a second-in-command up-grading to a pilot-in-command and who has not previously performed the maneuvers required by this paragraph in flight, meet the requirements of this paragraph applicable to initial training for pilots-in-command.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(4) In the case of flight crewmembers other than the pilot-in-command, perform the maneuver with the simulated loss of power of the most critical powerplant only.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
(f) Landing under simulated circling approach conditions (exceptions under III(n) applicable to this requirement).	B	.....	.....	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
(g) Rejected landings that include a normal missed approach procedure after the landing is rejected. For the purpose of this maneuver the landing should be rejected at approximately 50 feet and approximately over the runway threshold.	B	.....	.....	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
(h) Zero-flap landings if the Administrator finds that maneuver appropriate for training in the airplane.	P	.....	.....	.....	.....	.....	.....	PP, PJ.	.....	.....	.....	.....	PS	.....	
(i) Manual reversion (if appropriate)	.....	.....	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	
Training in landings and approaches to landings must include the types and conditions provided in IV(a) through (i) but more than one type may be combined where appropriate.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Training in one of the above landings must be accomplished at night. For transitioning pilots, this requirement may be met during the operating experience required under §121.434 of this part by performing a normal landing when a check pilot serving as pilot-in-command is occupying a pilot station.	B	.....	.....	.....	.....	AT	.....	.....	.....	.....	BU	.....	.....	.....	

[Doc. No. 9509, 35 FR 97, Jan. 3, 1970, as amended by Amdt. 121–91, 37 FR 10730, May 27, 1972; Amdt. 121–108, 38 FR 35446, Dec. 28, 1973; Amdt. 121–159, 45 FR 41595, June 19, 1980; Amdt. 121–199, 53 FR 37697, Sept. 27, 1988]

APPENDIX F TO PART 121—PROFICIENCY CHECK REQUIREMENTS

The maneuvers and procedures required by §121.441 for pilot proficiency checks are set forth in this appendix and must be performed inflight except to the extent that certain maneuvers and procedures may be performed in an airplane simulator with a visual system (visual simulator), an airplane simulator without a visual system (nonvisual simulator), or a training device as indicated by the appropriate symbol in the respective column opposite the maneuver or procedure.

Whenever a maneuver or procedure is authorized to be performed in a nonvisual simulator, it may also be performed in a visual simulator; when authorized in a training device, it may be performed in a visual or nonvisual simulator.

For the purpose of this appendix, the following symbols mean—

P=Pilot in Command.

B=Both Pilot in Command and Second in Command.

=A symbol and asterisk (B) indicates that a particular condition is specified in the maneuvers and procedures column.

#=When a maneuver is preceded by this symbol it indicates the maneuver may be required in the airplane at the discretion of the person conducting the check.

Throughout the maneuvers prescribed in this appendix, good judgment commensurate with a high level of safety must be demonstrated. In determining whether such judgment has been shown, the person conducting the check considers adherence to approved procedures, actions based on analysis of situations for which there is no prescribed procedure or recommended practice, and qualities of prudence and care in selecting a course of action.

Maneuvers/Procedures	Required		Permitted			
	Simulated instrument conditions	Inflight	Visual simulator	Nonvisual simulator	Training device	Waiver provisions of §121.441(d)
The procedures and maneuvers set forth in this appendix must be performed in a manner that satisfactorily demonstrates knowledge and skill with respect to—						
(1) The airplane, its systems and components;	.....	.....	.....	.....	.....	.....
(2) Proper control of airspeed, configuration, direction, altitude, and attitude in accordance with procedures and limitations contained in the approved Airplane Flight Manual, the certificate holder's operations Manual, check lists, or other approved material appropriate to the airplane type; and	.....	.....	.....	.....	.....	.....
(3) Compliance with approach, ATC, or other applicable procedures	.....	.....	.....	.....	.....	.....
I. Preflight:						
(a) Equipment examination (oral or written). As part of the practical test the equipment examination must be closely coordinated with, and related to, the flight maneuvers portion but may not be given during the flight maneuvers portion. The equipment examination must cover—	.....	.....	.....	.....	B	.....
(1) Subjects requiring a practical knowledge of the airplane, its powerplants, systems, components, operational, and performance factors;	.....	.....	.....	.....	.....	.....
(2) Normal, abnormal, and emergency procedures, and the operations and limitations relating thereto; and	.....	.....	.....	.....	.....	.....
(3) The appropriate provisions of the approved Airplane Flight Manual	.....	.....	.....	.....	.....	.....
The person conducting the check may accept, as equal to this equipment test, an equipment test given to the pilot in the certificate holder's ground school within the preceding 6 calendar months						
(b) Preflight inspection. The pilot must—	.....	.....	.....	.....	B	B*
(1) Conduct an actual visual inspection of the exterior and interior of the airplane, locating each item and explaining briefly the purpose for inspecting it; and	.....	.....	.....	.....	.....	.....
(2) Demonstrate the use of the prestart check list, appropriate control system checks, starting procedures, radio and electronic equipment checks, and the selection of proper navigation and communications radio facilities and frequencies prior to flight	.....	.....	.....	.....	.....	.....

Maneuvers/Procedures	Required		Permitted			
	Simulated instrument conditions	Inflight	Visual simulator	Non-visual simulator	Training device	Waiver provisions of §121.441(d)
Except for flight checks required by §121.424(d)(2), an approved pictorial means that realistically portrays the location and detail of preflight inspection items and provides for the portrayal of abnormal conditions may be substituted for the preflight inspection. If a flight engineer is a required flight crewmember for the particular type airplane, the visual inspection may be waived under §121.441(d)						
(c) Taxiing. This maneuver includes taxiing (in the case of a second in command proficiency check to the extent practical from the second in command crew position), sailing, or docking procedures in compliance with instructions issued by the appropriate traffic control authority or by the person conducting the checks	.....	B	.....	.....	.....	.....
(d) Powerplant checks. As appropriate to the airplane type	.....	.....	.....	B	.....	.....
II. Takeoff:						
(a) Normal. One normal takeoff which, for the purpose of this maneuver, begins when the airplane is taxied into position on the runway to be used	.....	B*	.....	.....	.....	.....
(b) Instrument. One takeoff with instrument conditions simulated at or before reaching an altitude of 100′ above the airport elevation	B	.....	B*	.....	.....	.....
(c) Crosswind. One crosswind takeoff, if practicable, under the existing meteorological, airport, and traffic conditions	.....	B*	.....	.....	.....	.....
Requirements (a) and (c) may be combined, and requirements (a), (b), and (c) may be combined if (b) is performed inflight						
#(d) Powerplant failure. One takeoff with a simulated failure of the most critical powerplant—	.....	.....	B	.....	.....	.....
(1) At a point after V_1 and before V_2 that in the judgment of the person conducting the check is appropriate to the airplane type under the prevailing conditions;	.....	.....	.....	.....	.....	.....
(2) At a point as close as possible after V_1 when V_1 and V_2 or V_1 and V_r are identical; or	.....	.....	.....	.....	.....	.....
(3) At the appropriate speed for non-transport category airplanes	.....	.....	.....	.....	.....	.....
In an airplane group with aft fuselage-mounted engines this maneuver may be performed in a non-visual simulator	.....	.....	.....	.....	.....	.....
(e) Rejected. A rejected takeoff may be performed in an airplane during a normal takeoff run after reaching a reasonable speed determined by giving due consideration to aircraft characteristics, runway length, surface conditions, wind direction and velocity, brake heat energy, and any other pertinent factors that may adversely affect safety or the airplane	.....	.....	.....	B*	.....	B
III. Instrument procedures:						
(a) Area departure and area arrival. During each of these maneuvers the applicant must—	B	.....	.....	B	.....	B*
(1) Adhere to actual or simulated ATC clearances (including assigned radials); and	.....	.....	.....	.....	.....	.....
(2) Properly use available navigation facilities	.....	.....	.....	.....	.....	.....
Either area arrival or area departure, but not both, may be waived under §121.441(d)						
(b) Holding. This maneuver includes entering, maintaining, and leaving holding patterns. It may be performed in connection with either area departure or area arrival	B	.....	.....	B	.....	B
(c) ILS and other instrument approaches. There must be the following:						
(1) At least one normal ILS approach	B	.....	B	.....	.....	.....
(2) At least one manually controlled ILS approach with a simulated failure of one powerplant. The simulated failure should occur before initiating the final approach course and must continue to touchdown or through the missed approach procedure	B	.....	.....	.....	.....	.....
(3) At least one nonprecision approach procedure that is representative of the nonprecision approach procedures that the certificate holder is likely to use	B	.....	B	.....	.....	.....

Maneuvers/Procedures	Required		Permitted			
	Simulated instrument conditions	Inflight	Visual simulator	Non-visual simulator	Training device	Waiver provisions of §121.441(d)
(4) Demonstration of at least one nonprecision approach procedure on a letdown aid other than the approach procedure performed under subparagraph (3) of this paragraph that the certificate holder is approved to use. If performed in a training device, the procedures must be observed by a check pilot or an approved instructor	B	.....	.....	.....	B	.....
Each instrument approach must be performed according to any procedures and limitations approved for the approach facility used. The instrument approach begins when the airplane is over the initial approach fix for the approach procedure being used (or turned over to the final approach controller in the case of GCA approach) and ends when the airplane touches down on the runway or when transition to a missed approach configuration is completed. Instrument conditions need not be simulated below 100′ above touchdown zone elevation						
(d) Circling approaches. If the certificate holder is approved for circling minimums below 1000–3, at least one circling approach must be made under the following conditions—	.....	.....	B*	.....	.....	B*
(1) The portion of the approach to the authorized minimum circling approach altitude must be made under simulated instrument conditions	B	.....	.....	.....	.....	.....
(2) The approach must be made to the authorized minimum circling approach altitude followed by a change in heading and the necessary maneuvering (by visual reference) to maintain a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach	.....	.....	.....	.....	.....	.....
(3) The circling approach must be performed without excessive maneuvering, and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30°	.....	.....	.....	.....	.....	.....
If local conditions beyond the control of the pilot prohibit the maneuver or prevent it from being performed as required, it may be waived as provided in §121.441(d): Provided, however, That the maneuver may not be waived under this provision for two successive proficiency checks. The circling approach maneuver is not required for a second-in-command if the certificate holder's manual prohibits a second-in-command from performing a circling approach in operations under this part						
(e) Missed approach	.....	.....	.....	.....	.....	.....
(1) Each pilot must perform at least one missed approach from an ILS approach	.....	.....	B*	.....	.....	.....
(2) Each pilot in command must perform at least one additional missed approach	.....	.....	P*	.....	.....	.....
A complete approved missed approach procedure must be accomplished at least once. At the discretion of the person conducting the check a simulated powerplant failure may be required during any of the missed approaches. These maneuvers may be performed either independently or in conjunction with maneuvers required under Sections III or V of this appendix. At least one missed approach must be performed in flight						
IV. Inflight Maneuvers:						
(a) Steep turns. At least one steep turn in each direction must be performed. Each steep turn must involve a bank angle of 45° with a heading change of at least 180° but not more than 360°	P	.....	.....	P	.....	P
(b) Approaches to stalls. For the purpose of this maneuver the required approach to a stall is reached when there is a perceptible buffet or other response to the initial stall entry. Except as provided below there must be at least three approaches to stalls as follows:	B	.....	.....	B	.....	B*

Maneuvers/Procedures	Required		Permitted			
	Simulated instrument conditions	Inflight	Visual simulator	Non-visual simulator	Training device	Waiver provisions of §121.441(d)
(1) One must be in the takeoff configuration (except where the airplane uses only a zero-flap takeoff configuration)	.....	.....	.....	.....	.....	.....
(2) One in a clean configuration	.....	.....	.....	.....	.....	.....
(3) One in a landing configuration	.....	.....	.....	.....	.....	.....
At the discretion of the person conducting the check, one approach to a stall must be performed in one of the above configurations while in a turn with the bank angle between 15° and 30°. Two out of the three approaches required by this paragraph may be waived						
If the certificate holder is authorized to dispatch or flight release the airplane with a stall warning device inoperative the device may not be used during this maneuver						
(c) Specific flight characteristics. Recovery from specific flight characteristics that are peculiar to the airplane type	.....	.....	.....	B	.....	B
(d) Powerplant failures. In addition to specific requirements for maneuvers with simulated powerplant failures, the person conducting the check may require a simulated powerplant failure at any time during the check	.....	.....	.....	B	.....	.....
V. Landings and Approaches to Landings:						
Notwithstanding the authorizations for combining and waiving maneuvers and for the use of a simulator, at least two actual landings (one to a full stop) must be made for all pilot-in-command and initial second-in-command proficiency checks. Landings, and approaches to landings must include the following, but more than one type may be combined where appropriate:						
Landings and approaches to landings must include the types listed below, but more than one type may be combined where appropriate:						
(a) Normal landing	.....	B	.....	.....	.....	.....
(b) Landing in sequence from an ILS instrument approach except that if circumstances beyond the control of the pilot prevent an actual landing, the person conducting the check may accept an approach to a point where in his judgment a landing to a full stop could have been made	.....	B*	.....	.....	.....	.....
(c) Crosswind landing, if practical under existing meteorological, airport, and traffic conditions	.....	B*	.....	.....	.....	.....
(d) Maneuvering to a landing with simulated powerplant failure as follows:						
(1) In the case of 3–engine airplanes, maneuvering to a landing with an approved procedure that approximates the loss of two powerplants (center and one outboard engine); or	.....	.....	B*	.....	.....	.....
(2) In the case of other multiengine airplanes, maneuvering to a landing with a simulated failure of 50 percent of available powerplants, with the simulated loss of power on one side of the airplane	.....	.....	B*	.....	.....	.....

Maneuvers/Procedures	Required		Permitted			
	Simulated instrument conditions	Inflight	Visual simulator	Non-visual simulator	Training device	Waiver provisions of §121.441(d)
Notwithstanding the requirements of subparagraphs (d) (1) and (2) of this paragraph, in a proficiency check for other than a pilot-in-command, the simulated loss of power may be only the most critical powerplant. However, if a pilot satisfies the requirements of subparagraphs (d) (1) or (2) of this paragraph in a visual simulator, he also must maneuver in flight to a landing with a simulated failure of the most critical powerplant. In addition, a pilot-in-command may omit the maneuver required by subparagraph (d)(1) or (d)(2) of this paragraph during a required proficiency check or simulator course of training if he satisfactorily performed that maneuver during the preceding proficiency check, or during the preceding approved simulator course of training under the observation of a check airman, whichever was completed later						
(e) Except as provided in paragraph (f) of this section, if the certificate holder is approved for circling minimums below 1000–3, a landing under simulated circling approach conditions. However, when performed in an airplane, if circumstances beyond the control of the pilot prevent a landing, the person conducting the check may accept an approach to a point where, in his judgment, a landing to a full stop could have been made	.....	.....	B*	.....	.....	.....
#(f) A rejected landing, including a normal missed approach procedure, that is rejected approximately 50′ over the runway and approximately over the runway threshold. This maneuver may be combined with instrument, circling, or missed approach procedures, but instrument conditions need not be simulated below 100 feet above the runway	.....	.....	B	.....	.....	.....
VI. Normal and Abnormal Procedures:						
Each applicant must demonstrate the proper use of as many of the systems and devices listed below as the person conducting the check finds are necessary to determine that the person being checked has a practical knowledge of the use of the systems and devices appropriate to the airplane type:						
(a) Anti-icing and de-icing systems	.....	.....	.....	B	.....	.....
(b) Auto-pilot systems	.....	.....	.....	B	.....	.....
(c) Automatic or other approach aid systems	.....	.....	.....	B	.....	.....
(d) Stall warning devices, stall avoidance devices, and stability augmentation devices	.....	.....	.....	B	.....	.....
(e) Airborne radar devices	.....	.....	.....	B	.....	.....
(f) Any other systems, devices, or aids available	.....	.....	.....	B	.....	.....
(g) Hydraulic and electrical system failures and malfunctions	.....	.....	.....	.....	B	.....
(h) Landing gear and flap systems failure or malfunction	.....	.....	.....	.....	B	.....
(i) Failure of navigation or communications equipment	.....	.....	.....	B	.....	.....
VII. Emergency Procedures:						
Each applicant must demonstrate the proper emergency procedures for as many of the emergency situations listed below as the person conducting the check finds are necessary to determine that the person being checked has an adequate knowledge of, and ability to perform, such procedure:						
(a) Fire in flight	.....	.....	.....	B	.....	.....
(b) Smoke control	.....	.....	.....	B	.....	.....
(c) Rapid decompression	.....	.....	.....	B	.....	.....
(d) Emergency descent	.....	.....	.....	B	.....	.....
(e) Any other emergency procedures outlined in the appropriate approved Airplane Flight Manual	.....	.....	.....	B	.....	.....

[Doc. No. 9509, 35 FR 99, Jan. 3, 1970, as amended by Amdt. 121–80, 36 FR 19362, Oct. 5, 1971; Amdt. 121–91, 37 FR 10730, May 27, 1972; Amdt. 121–92, 37 FR 12717, June 28, 1972; Amdt. 121–108, 38 FR 35448, Dec. 28, 1973; Amdt. 121–136, 42 FR 43389, Aug. 29, 1977]

APPENDIX G TO PART 121—DOPPLER RADAR AND INERTIAL NAVIGATION SYSTEM (INS): REQUEST FOR EVALUATION; EQUIPMENT AND EQUIPMENT INSTALLATION; TRAINING PROGRAM; EQUIPMENT ACCURACY AND RELIABILITY; EVALUATION PROGRAM

1. *Application authority.* (a) An applicant for authority to use a Doppler Radar or Inertial Navigation System must submit a request for evaluation of the system to the Flight Standards District Office or International Field Office charged with the overall inspection of its operations 30 days prior to the start of evaluation flights.

(b) The application must contain:

(1) A summary of experience with the system showing to the satisfaction of the Administrator a history of the accuracy and reliability of the system proposed to be used.

(2) A training program curriculum for initial approval under §121.405.

(3) A maintenance program for compliance with subpart L of this part.

(4) A description of equipment installation.

(5) Proposed revisions to the Operations Manual outlining all normal and emergency procedures relative to use of the proposed system, including detailed methods for continuing the navigational function with partial or complete equipment failure, and methods for determining the most accurate system when an unusually large divergence between systems occurs. For the purpose of this appendix, a large divergence is a divergence that results in a track that falls beyond clearance limits.

(6) Any proposed revisions to the minimum equipment list with adequate justification therefor.

(7) A list of operations to be conducted using the system, containing an analysis of each with respect to length, magnetic compass reliability, availability of en route aids, and adequacy of gateway and terminal radio facilities to support the system. For the purpose of this appendix, a gateway is a specific navigational fix where use of long range navigation commences or terminates.

2. *Equipment and equipment installation—Inertial Navigation Systems* (*INS*) *orDoppler Radar System.* (a) Inertial Navigation and Doppler Radar Systems must be installed in accordance with applicable airworthiness requirements.

(b) Cockpit arrangement must be visible and useable by either pilot seated at his duty station.

(c) The equipment must provide, by visual, mechanical, or electrical output signals, indications of the invalidity of output data upon the occurrence of probable failures or malfunctions within the system.

(d) A probable failure or malfunction within the system must not result in loss of the aircraft's required navigation capability.

(e) The alignment, updating, and navigation computer functions of the system must not be invalidated by normal aircraft power interruptions and transients.

(f) The system must not be the source of cause of objectionable radio frequency interference, and must not be adversely affected by radio frequency interference from other aircraft systems.

(g) The FAA-approved airplane flight manual, or supplement thereto, must include pertinent material as required to define the normal and emergency operating procedures and applicable operating limitations associated with INS and Doppler performance (such as maximum latitude at which ground alignment capability is provided, or deviations between systems).

3. *Equipment and equipment installation—Inertial Navigation Systems* (*INS*). (a) If an applicant elects to use an Inertial Navigation System it must be at least a dual system (including navigational computers and reference units). At least two systems must be operational at takeoff. The dual system may consist of either two INS units, or one INS unit and one Doppler Radar unit.

(b) Each Inertial Navigation System must incorporate the following:

(1) Valid ground alignment capability at all latitudes appropriate for intended use of the installation.

(2) A display of alignment status or a ready to navigate light showing completed alignment to the flight crew.

(3) The present position of the airplane in suitable coordinates.

(4) Information relative to destinations or waypoint positions:

(i) The information needed to gain and maintain a desired track and to determine deviations from the desired track.

(ii) The information needed to determine distance and time to go to the next waypoint or destination.

(c) For INS installations that do not have memory or other inflight alignment means, a separate electrical power source (independent of the main propulsion system) must be provided which can supply, for at least 5 minutes, enough power (as shown by analysis or as demonstrated in the airplane) to maintain the INS in such condition that its full capability is restored upon the reactivation of the normal electrical supply.

(d) The equipment must provide such visual, mechanical, or electrical output signals as may be required to permit the flight crew to detect probable failures or malfunctions in the system.

4. *Equipment and equipment installation—Doppler Radar Systems.* (a) If an applicant elects to use a Doppler Radar System it must be at least a dual system (including

dual antennas or a combined antenna designed for multiple operation), except that:

(1) A single operating transmitter with a standby capable of operation may be used in lieu of two operating transmitters.

(2) Single heading source information to all installations may be utilized, provided a compass comparator system is installed and operational procedures call for frequent cross-checks of all compass heading indicators by crewmembers.

The dual system may consist of either two Doppler Radar units or one Doppler Radar unit and one INS unit.

(b) At least two systems must be operational at takeoff.

(c) As determined by the Administrator and specified in the certificate holder's operations specifications, other navigational aids may be required to update the Doppler Radar for a particular operation. These may include Loran, Consol, DME, VOR, ADF, ground-based radar, and airborne weather radar. When these aids are required, the cockpit arrangement must be such that all controls are accessible to each pilot seated at his duty station.

5. *Training programs.* The initial training program for Doppler Radar and Inertial Navigation Systems must include the following:

(a) Duties and responsibilities of flight crewmembers, dispatchers, and maintenance personnel.

(b) For pilots, instruction in the following:

(1) Theory and procedures, limitations, detection of malfunctions, preflight and inflight testing, and cross-checking methods.

(2) The use of computers, an explanation of all systems, compass limitations at high latitudes, a review of navigation, flight planning, and applicable meteorology.

(3) The methods for updating by means of reliable fixes.

(4) The actual plotting of fixes.

(c) Abnormal and emergency procedures.

6. *Equipment accuracy and reliability.* (a) Each Inertial Navigation System must meet the following accuracy requirements, as appropriate:

(1) For flights up to 10 hours' duration, no greater than 2 nautical miles per hour of circular error on 95 percent of system flights completed is permitted.

(2) For flights over 10 hours' duration, a tolerance of ±20 miles cross-track and ±25 miles along-track on 95 percent of system flights completed is permitted.

(b) Compass heading information to the Doppler Radar must be maintained to an accuracy of ±1° and total system deviations must not exceed 2°. When free gyro techniques are used, procedures shall be utilized to ensure that an equivalent level of heading accuracy and total system deviation is attained.

(c) Each Doppler Radar System must meet accuracy requirements of ±20 miles cross-track and ±25 miles along-track for 95 percent of the system flights completed. Updating is permitted.

A system that does not meet the requirements of this section will be considered a failed system.

7. *Evaluation program.* (a) Approval by evaluation must be requested as a part of the application for operational approval of a Doppler Radar or Inertial Navigation System.

(b) The applicant must provide sufficient flights which show to the satisfaction of the Administrator the applicant's ability to use cockpit navigation in his operation.

(c) The Administrator bases his evaluation on the following:

(1) Adequacy of operational procedures.

(2) Operational accuracy and reliability of equipment and feasibility of the system with regard to proposed operations.

(3) Availability of terminal, gateway, area, and en route ground-based aids, if required, to support the self-contained system.

(4) Acceptability of cockpit workload.

(5) Adequacy of flight crew qualifications.

(6) Adequacy of maintenance training and availability of spare parts.

After successful completion of evaluation demonstrations, FAA approval is indicated by issuance of amended operations specifications and en route flight procedures defining the new operation. Approval is limited to those operations for which the adequacy of the equipment and the feasibility of cockpit navigation has been satisfactorily demonstrated.

[Doc. No. 10204, 37 FR 6464, Mar. 30, 1972, as amended by Amdt. 121–207, 54 FR 39293, Sept. 25, 1989]

APPENDIX H TO PART 121—ADVANCED SIMULATION

This appendix provides guidelines and a means for achieving flightcrew training in advanced airplane simulators. This appendix describes the simulator and visual system requirements which must be achieved to obtain approval of certain types of training in the simulator. The requirements in this appendix are in addition to the simulator approval requirements in §121.407. Each simulator which is used under this appendix must be approved as a Level B, C, or D simulator, as appropriate.

To obtain FAA approval of the simulator for a specific level, the following must be demonstrated to the satisfaction of the Administrator:

1. Documented proof of compliance with the appropriate simulator, visual system, and additional training requirements of this appendix for the level for which approval is requested.

2. An evaluation of the simulator to ensure that its ground, flight, and landing performance matches the type of airplane simulated.
3. An evaluation of the appropriate simulator and visual system requirements of the level for which approval is requested.

CHANGES TO SIMULATOR PROGRAMING

While a need exists for some flexibility in making changes in the software program, strict scrutiny of these changes is essential to ensure that the simulator retains its ability to duplicate the airplane's flight and ground characteristics. Therefore, the following procedure must be followed to allow these changes without affecting the approval of an appendix H simulator:

1. Twenty-one calendar days before making changes to the software program which might impact flight or ground dynamics of an appendix H simulator, a complete list of these planned changes, including dynamics related to the motion and visual systems, must be provided in writing to the FAA office responsible for conducting the recurrent evaluation of that simulator.
2. If the FAA does not object to the planned change within 21 calendar days, the operator may make the change.
3. Changes which might affect the approved simulator Level B test guide must be tested by the operator in the simulator to determine the impact of the change before submission to the FAA.
4. Software changes actually installed must be summarized and provided to the FAA. When the operator's test shows a difference in simulator performance due to a change, an amended copy of the test guide page which includes the new simulator test results will also be provided to update the FAA's copy of the test guide.
5. The FAA may examine supporting data or flight check the simulator, or both, to ensure that the aerodynamic quality of the simulator has not been degraded by any change in software programing.
6. All requests for changes are evaluated on the basis of the same criteria used in the initial approval of the simulator for Level B, C, or D.

SIMULATOR MINIMUM EQUIPMENT LIST (MEL)

Because of the strict tolerances and other approval requirements of appendix H simulators, the simulator can provide realistic training with certain nonessential items inoperative. Therefore, an operator may operate its simulator under an MEL which has been approved by the Administrator for that simulator. The MEL includes simulator components and indicates the type of training or checking that is authorized if the component becomes inoperative. To accomplish this, the component is placed in one of the following categories along with any remarks applicable to the component's use in the training program:

1. No training or checking.
2. Training in specific maneuvers.
3. Certification and checking.
4. Line Oriented Flight Training (LOFT).

ADVANCED SIMULATION TRAINING PROGRAM

For an operator to conduct Level C or D training under this appendix all required simulator instruction and checks must be conducted under an advanced simulation training program which is approved by the Administrator for the operator. This program must also ensure that all instructors and check airmen used in appendix H training and checking are highly qualified to provide the training required in the training program. The advanced simulation training program shall include the following:

1. The operator's initial, transition, upgrade, and recurrent simulator training programs and its procedures for re-establishing recency of experience in the simulator.
2. How the training program will integrate Level B, C, and D simulators with other simulators and training devices to maximize the total training, checking, and certification functions.
3. Documentation that each instructor and check airman has served for at least 1 year in that capacity in a certificate holder's approved program or has served for at least 1 year as a pilot in command or second in command in an airplane of the group in which that pilot is instructing or checking.
4. A procedure to ensure that each instructor and check airman actively participates in either an approved regularly scheduled line flying program as a flight crewmember or an approved line observation program in the same airplane type for which that person is instructing or checking.
5. A procedure to ensure that each instructor and check airman is given a minimum of 4 hours of training each year to become familiar with the operator's advanced simulation training program, or changes to it, and to emphasize their respective roles in the program. Training for simulator instructors and check airmen shall include training policies and procedures, instruction methods and techniques, operation of simulator controls (including environmental and trouble panels), limitations of the simulator, and minimum equipment required for each course of training.
6. A special Line Oriented Flight Training (LOFT) program to facilitate the transition from the simulator to line flying. This LOFT program consists of at least a 4-hour course of training for each flightcrew. It also contains at least two representative flight segments of the operator's route. One of the flight segments contains strictly normal operating procedures from push back at one airport to arrival at another. Another flight

segment contains training in appropriate abnormal and emergency flight operations.

LEVEL B

Training and Checking Permitted

1. Recency of experience (§121.439).
2. Night takeoffs and landings (part 121, appendix E).
3. Landings in a proficiency check without the landing on the line requirements (§121.441).

Simulator Requirements

1. Aerodynamic programing to include:
a. Ground effect—for example, roundout, flare, and touchdown. This requires data on lift, drag, and pitching moment in ground effect.
b. Ground reaction—Reaction of the airplane upon contact with the runway during landing to include strut deflections, tire friction, and side forces.
c. Ground handling characteristics—steering inputs to include crosswind, braking, thrust reversing, deceleration, and turning radius.
2. Minimum of 3-axis freedom of motion systems.
3. Level B landing maneuver test guide to verify simulator data with actual airplane flight test data, and provide simulator performance tests for Level B initial approval.
4. Multichannel recorders capable of recording Level B performance tests.

Visual Requirements

1. Visual system compatibility with aerodynamic programing.
2. Visual system response time from pilot control input to visual system output shall not exceed 300 milliseconds more than the movement of the airplane to a similar input. Visual system response time is defined as the completion of the visual display scan of the first video field containing different information resulting from an abrupt control input.
3. A means of recording the visual response time for comparison with airplane data.
4. Visual cues to assess sink rate and depth perception during landings.
5. Visual scene to instrument correlation to preclude perceptible lags.

LEVEL C

Training and Checking Permitted

1. For all pilots, transition training between airplanes in the same group, and for a pilot in command the certification check required by §61.153(g) this chapter.
2. Upgrade to pilot-in-command training and the certification check when the pilot—
a. Has previously qualified as second in command in the equipment to which the pilot is upgrading;
b. Has at least 500 hours of actual flight time while serving as second in command in an airplane of the same group; and
c. Is currently serving as second in command in an airplane in this same group.
3. Initial pilot-in-command training and the certification check when the pilot—
a. Is currently serving as second in command in an airplane of the same group;
b. Has a minimum of 2,500 flight hours as second in command in an airplane of the same group; and
c. Has served as second in command on at least two airplanes of the same group.
4. For all second-in command pilot applicants who meet the aeronautical experience requirements of §61.159 of this chapter in the airplane, the initial and upgrade training and checking required by this part, and the certification check requirements of §61.153 of this chapter.

Simulator Requirements

1. Representative crosswind and three-dimensional windshear dynamics based on airplane related data.
2. Representative stopping and directional control forces for at least the following runway conditions based on airplane related data:
a. Dry.
b. Wet.
c. Icy.
d. Patchy wet.
e. Patchy icy.
f. Wet on rubber residue in touchdown zone.
3. Representative brake and tire failure dynamics (including antiskid) and decreased brake efficiency due to high brake temperatures based on airplane related data.
4. A motion system which provides motion cues equal to or better than those provided by a six-axis freedom of motion system.
5. Operational principal navigation systems, including electronic flight instrument systems, INS, and OMEGA, if applicable.
6. Means for quickly and effectively testing simulator programing and hardware.
7. Expanded simulator computer capacity, accuracy, resolution, and dynamic response to meet Level C demands. Resolution equivalent to that of at least a 32-bit word length computer is required for critical aerodynamic programs.
8. Timely permanent update of simulator hardware and programing subsequent to airplane modification.
9. Sound of precipitation and significant airplane noises perceptible to the pilot during normal operations and the sound of a crash when the simulator is landed in excess of landing gear limitations.
10. Aircraft control feel dynamics shall duplicate the airplane simulated. This shall be determined by comparing a recording of the control feel dynamics of the simulator to

airplane measurements in the takeoff, cruise, and landing configuration.

11. Relative responses of the motion system, visual system, and cockpit instruments shall be coupled closely to provide integrated sensory cues. These systems shall respond to abrupt pitch, roll, and yaw inputs at the pilot's position within 150 milliseconds of the time, but not before the time, when the airplane would respond under the same conditions. Visual scene changes from steady state disturbance shall not occur before the resultant motion onset but within the system dynamic response tolerance of 150 milliseconds. The test to determine compliance with these requirements shall include simultaneously recording the analog output from the pilot's control column and rudders, the output from an accelerometer attached to the motion system platform located at an acceptable location near the pilots' seats, the output signal to the visual system display (including visual system analog delays), and the output signal to the pilot's attitude indicator or an equivalent test approved by the Administrator. The test results in a comparison of a recording of the simulator's response to actual airplane response data in the takeoff, cruise, and landing configuration.

Visual Requirements

1. Dusk and night visual scenes with at least three specific airport representations, including a capability of at least 10 levels of occulting, general terrain characteristics, and significant landmarks.

2. Radio navigation aids properly oriented to the airport runway layout.

3. Test procedures to quickly confirm visual system color, RVR, focus, intensity, level horizon, and attitude as compared to the simulator attitude indicator.

4. For the approach and landing phase of flight, at and below an altitude of 2,000 feet height above the airport (HAA) and within a radius of 10 miles from the airport, weather representations including the following:

a. Variable cloud density.

b. Partial obscuration of ground scenes; that is, the effect of a scattered to broken cloud deck.

c. Gradual break out.

d. Patchy fog.

e. The effect of fog on airport lighting.

f. Category II and III weather conditions.

5. Continuous minimum visual field of view of 75° horizontal and 30° vertical per pilot seat. Visual gaps shall occur only as they would in the airplane simulated or as required by visual system hardware. Both pilot seat visual systems shall be able to be operated simultaneously.

6. Capability to present ground and air hazards such as another airplane crossing the active runway or converging airborne traffic.

LEVEL D

Training and Checking Permitted

Except for the requirements listed in the next sentence, all pilot flight training and checking required by this part and the certification check requirements of §61.153(g) of this chapter. The line check required by §121.440 of this part, the static airplane requirements of appendix E of this part, and the operating experience requirements of §121.434 of this part must still be performed in the airplane.

Simulator Requirements

1. Characteristic buffet motions that result from operation of the airplane (for example, high-speed buffet, extended landing gear, flaps, nose-wheel scuffing, stall) which can be sensed at the flight deck. The simulator must be programed and instrumented in such a manner that the characteristic buffet modes can be measured and compared to airplane data. Airplane data are also required to define flight deck motions when the airplane is subjected to atmospheric disturbances such as rough air and cobblestone turbulence. General purpose disturbance models that approximate demonstrable flight test data are acceptable.

2. Aerodynamic modeling for aircraft for which an original type certificate is issued after June 1, 1980, including low-altitude, level-flight ground effect, mach effect at high altitude, effects of airframe icing, normal and reverse dynamic thrust effect on control surfaces, aero-elastic representations, and representations of nonlinearities due to side slip based on airplane flight test data provided by the manufacturer.

3. Realistic amplitude and frequency of cockpit noises and sounds, including precipitation static and engine and airframe sounds. The sounds shall be coordinated with the weather representations required in visual requirement No. 3.

4. Self-testing for simulator hardware and programing to determine compliance with Level B, C, and D simulator requirements.

5. Diagnostic analysis printout of simulator malfunctions sufficient to determine MEL compliance. These printouts shall be retained by the operator between recurring FAA simulator evaluations as part of the daily discrepancy log required under §121.407(a)(5).

Visual Requirements

1. Daylight, dusk, and night visual scenes with sufficient scene content to recognize a specific airport, the terrain, and major landmarks around that airport and to successfully accomplish a visual landing. The daylight visual scene must be part of a total daylight cockpit environment which at least represents the amount of light in the cockpit

on an overcast day. For the purpose of this rule, daylight visual system is defined as a visual system capable of producing, as a minimum, full color presentations, scene content comparable in detail to that produced by 4,000 edges or 1,000 surfaces for daylight and 4,000 light points for night and dusk scenes, 6-foot lamberts of light at the pilot's eye (highlight brightness), 3-arc minutes resolution for the field of view at the pilot's eye, and a display which is free of apparent quantization and other distracting visual effects while the simulator is in motion. The simulation of cockpit ambient lighting shall be dynamically consistent with the visual scene displayed. For daylight scenes, such ambient lighting shall neither ''washout'' the displayed visual scene nor fall below 5-foot lamberts of light as reflected from an approach plate at knee height at the pilot's station and/or 2-foot lamberts of light as reflected from the pilot's face.

2. Visual scenes portraying representative physical relationships which are known to cause landing illusions in some pilots, including short runway, landing over water, runway gradient, visual topographic features, and rising terrain.

3. Special weather representations which include the sound, visual, and motion effects of entering light, medium, and heavy precipitation near a thunderstorm on takeoff, approach, and landings at and below an altitude of 2,000 feet HAA and within a radius of 10 miles from the airport.

4. Level C visual requirements in daylight as well as dusk and night representations.

5. Wet and, if appropriate for the operator, snow-covered runway representations, including runway lighting effects.

6. Realistic color and directionality of airport lighting.

7. Weather radar presentations in aircraft where radar information is presented on the pilot's navigation instruments.

(Secs. 313, 601, 603, 604, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354, 1421, 1423, 1424); sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c)))

[Doc. No. 19758, 45 FR 44183, June 30, 1980; 45 FR 48599, July 31, 1980, as amended by Amdt. 121–258, 61 FR 30732, June 17, 1996; 61 FR 39859, July 31, 1996; Amdt. 121–267, 62 FR 68137, Dec. 30, 1997]

APPENDIX I TO PART 121—DRUG TESTING PROGRAM

This appendix contains the standards and components that must be included in an antidrug program required by this chapter.

I. *DOT Procedures.* Each employer shall ensure that drug testing programs conducted pursuant to 14 CFR parts 65, 121, and 135 comply with the requirements of this appendix and the ''Procedures for Transportation Workplace Drug Testing Programs'' published by the Department of Transportation (DOT) (49 CFR part 40). An employer may not use or contract with any drug testing laboratory that is not certified by the Department of Health and Human Services (DHHS) pursuant to the DHHS ''Mandatory Guidelines for Federal Workplace Drug Testing Programs'' (53 FR 11970; April 11, 1988 as amended by 59 FR 29908; June 9, 1994).

II. *Definitions.* For the purpose of this appendix, the following definitions apply:

Accident means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

Annualized rate for the purposes of unannounced testing of employees based on random selection means the percentage of specimen collection and testing of employees performing a safety-sensitive function during a calendar year. The employer shall determine the annualized rate by referring to the total number of employees performing a safety-sensitive function for the employer at the beginning of the calendar year.

Contractor company means a company that has employees who perform safety-sensitive functions by contract for an employer.

DOT agency means an agency (or ''operating administration'') of the United States Department of Transportation administering regulations requiring drug testing (14 CFR part 61 et al.; 46 CFR part 16; 49 CFR parts 199, 219, and 382) in accordance with 49 CFR part 40.

Employee is a person who performs, either directly or by contract, a safety-sensitive function for an employer, as defined below. Provided, however, that an employee who works for an employer who holds a part 135 certificate and who holds a part 121 certificate is considered to be an employee of the part 121 certificate holder for the purposes of this appendix.

Employer is a part 121 certificate holder, a part 135 certificate holder, an operator as defined in §135.1(c) of this chapter, or an air traffic control facility not operated by the FAA or by or under contract to the U.S. military. Provided, however, that an employer may use a person who is not included under that employer's drug program to perform a safety-sensitive function, if that person is subject to the requirements of another employer's FAA-approved antidrug program.

Performing (a safety-sensitive function): an employee is considered to be performing a safety-sensitive function during any period in which he or she is actually performing, ready to perform, or immediately available to perform such function.

Positive rate means the number of positive results for random drug tests conducted under this appendix plus the number of refusals to take random tests required by this appendix, divided by the total number of random drug tests conducted under this appendix plus the number of refusals to take random tests required by this appendix.

Prohibited drug means marijuana, cocaine, opiates, phencyclidine (PCP), amphetamines, or a substance specified in Schedule I or Schedule II of the Controlled Substances Act, 21 U.S.C. 811, 812, unless the drug is being used as authorized by a legal prescription or other exemption under Federal, state, or local law.

Refusal to submit means that an individual failed to provide a urine sample as required by 49 CFR part 40, without a genuine inability to provide a specimen (as determined by a medical evaluation), after he or she has received notice of the requirement to be tested in accordance with this appendix, or engaged in conduct that clearly obstructed the testing process.

Safety-sensitive function means a function listed in section III of this appendix.

Verified negative drug test result means that the test result of a urine sample collected and tested under this appendix has been verified by a Medical Review Officer as negative in accordance with 49 CFR part 40.

Verified positive drug test result means that the test result of a urine sample collected and tested under this appendix has been verified by a Medical Review Officer as positive in accordance with 49 CFR part 40.

III. *Employees Who Must Be Tested*. Each person who performs a safety-sensitive function directly or by contract for an employer must be tested pursuant to an FAA-approved antidrug program conducted in accordance with this appendix:

A. Flight crewmember duties.

B. Flight attendant duties.

C. Flight instruction duties.

D. Aircraft dispatcher duties.

E. Aircraft maintenance or preventive maintenance duties.

F. Ground security coordinator duties.

G. Aviation screening duties.

H. Air traffic control duties.

IV. *Substances for Which Testing Must Be Conducted*. Each employer shall test each employee who performs a safety-sensitive function for evidence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines during each test required by section V of this appendix. As part of a reasonable cause drug testing program established pursuant to this part, employers may test for drugs in addition to those specified in this part only with approval granted by the FAA under 49 CFR part 40 and for substances for which the Department of Health and Human Services has established an approved testing protocol and positive threshold.

V. *Types of Drug Testing Required*. Each employer shall conduct the following types of testing in accordance with the procedures set forth in this appendix and the DOT ''Procedures for Transportation Workplace Drug Testing Programs'' (49 CFR part 40):

A. *Pre-employment Testing*.

1. Prior to the first time an individual performs a safety-sensitive function for an employer, the employer shall require the individual to undergo testing for prohibited drug use.

2. An employer is permitted to require pre-employment testing of an individual if the following criteria are met:

(a) The individual previously performed a covered function for the employer;

(b) The employer removed the individual from the employer's random testing program conducted under this appendix for reasons other than a verified positive test result on an FAA-mandated drug test or a refusal to submit to such testing; and

(c) The individual will be returning to the performance of a safety-sensitive function.

3. No employer shall allow an individual required to undergo pre-employment testing under section V, paragraphs A.1 or A.2 of this appendix to perform a safety-sensitive function unless the employer has received a verified negative drug test result for the individual.

4. The employer shall advise each individual applying to perform a safety-sensitive function at the time of application that the individual will be required to undergo pre-employment testing to determine the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs in the individual's system. The employer shall provide this same notification to each individual required by the employer to undergo pre-employment testing under section V, paragraph A.(2) of this appendix.

B. *Periodic Testing*. Each employee who performs a safety-sensitive function for an employer and who is required to undergo a medical examination under part 67 of this chapter shall submit to a periodic drug test. The employee shall be tested for the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs during the first calendar year of implementation of the employer's antidrug program. The tests shall be conducted in conjunction with the first medical evaluation of the employee or in accordance with an alternative method for collecting periodic test specimens detailed in an employer's approved antidrug program. An employer may discontinue periodic testing of its employees after the first calendar year of implementation of the employer's antidrug program when the employer has implemented an unannounced testing program based on random selection of employees.

C. *Random Testing.*

1. Except as provided in paragraphs 2–4 of this section, the minimum annual percentage rate for random drug testing shall be 50 percent of covered employees.

2. The Administrator's decision to increase or decrease the minimum annual percentage rate for random drug testing is based on the reported positive rate for the entire industry. All information used for this determination is drawn from the statistical reports required by section X of this appendix. In order to ensure reliability of the data, the Administrator considers the quality and completeness of the reported data, may obtain additional information or reports from employers, and may make appropriate modifications in calculating the industry positive rate. Each year, the Administrator will publish in the FEDERAL REGISTER the minimum annual percentage rate for random drug testing of covered employees. The new minimum annual percentage rate for random drug testing will be applicable starting January 1 of the calendar year following publication.

3. When the minimum annual percentage rate for random drug testing is 50 percent, the Administrator may lower this rate to 25 percent of all covered employees if the Administrator determines that the data received under the reporting requirements of this appendix for two consecutive calendar years indicate that the reported positive rate is less than 1.0 percent.

4. When the minimum annual percentage rate for random drug testing is 25 percent, and the data received under the reporting requirements of this appendix for any calendar year indicate that the reported positive rate is equal to or greater than 1.0 percent, the Administrator will increase the minimum annual percentage rate for random drug testing to 50 percent of all covered employees.

5. The selection of employees for random drug testing shall be made by a scientifically valid method, such as a random-number table or a computer-based random number generator that is matched with employees' Social Security numbers, payroll identification numbers, or other comparable identifying numbers. Under the selection process used, each covered employee shall have an equal chance of being tested each time selections are made.

6. The employer shall randomly select a sufficient number of covered employees for testing during each calendar year to equal an annual rate not less than the minimum annual percentage rate for random drug testing determined by the Administrator. If the employer conducts random drug testing through a consortium, the number of employees to be tested may be calculated for each individual employer or may be based on the total number of covered employees covered by the consortium who are subject to random drug testing at the same minimum annual percentage rate under this part or any DOT drug testing rule.

7. Each employer shall ensure that random drug tests conducted under this appendix are unannounced and that the dates for administering random tests are spread reasonably throughout the calendar year.

8. If a given covered employee is subject to random drug testing under the drug testing rules of more than one DOT agency, the employee shall be subject to random drug testing at the percentage rate established for the calendar year by the DOT agency regulating more than 50 percent of the employee's function.

9. If an employer is required to conduct random drug testing under the drug testing rules of more than one DOT agency, the employer may—

(a) Establish separate pools for random selection, with each pool containing the covered employees who are subject to testing at the same required rate; or

(b) Randomly select covered employees for testing at the highest percentage rate established for the calendar year by any DOT agency to which the employer is subject.

10. An employer required to conduct random drug testing under the anti drug rules of more than one DOT agency shall provide each such agency access to the employer's records of random drug testing, as determined to be necessary by the agency to ensure the employer's compliance with the rule.

D. *Post-accident Testing.* Each employer shall test each employee who performs a safety-sensitive function for the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs in the employee's system if that employee's performance either contributed to an accident or can not be completely discounted as a contributing factor to the accident. The employee shall be tested as soon as possible but not later than 32 hours after the accident. The decision not to administer a test under this section must be based on a determination, using the best information available at the time of the determination, that the employee's performance could not have contributed to the accident. The employee shall submit to post-accident testing under this section.

E. *Testing Based on Reasonable Cause.* Each employer shall test each employee who performs a safety-sensitive function and who is reasonably suspected of using a prohibited drug. Each employer shall test an employee's specimen for the presence of marijuana, cocaine, opiates, phencyclidine (PCP), and amphetamines, or a metabolite of those drugs. An employer may test an employee's specimen for the presence of other prohibited drugs or drug metabolites only in accordance with this appendix and the DOT ''Procedures for Transportation Workplace Drug Testing

Programs'' (49 CFR part 40). At least two of the employee's supervisors, one of whom is trained in detection of the symptoms of possible drug use, shall substantiate and concur in the decision to test an employee who is reasonably suspected of drug use; provided, however, that in the case of an employer other than a part 121 certificate holder who employs 50 or fewer employees who perform safety-sensitive functions, one supervisor who is trained in detection of symptoms of possible drug use shall substantiate the decision to test an employee who is reasonably suspected of drug use. The decision to test must be based on a reasonable and articulable belief that the employee is using a prohibited drug on the basis of specific contemporaneous physical, behavioral, or performance indicators of probable drug use.

F. *Return to Duty Testing.* Each employer shall ensure that before an individual is returned to duty to perform a safety-sensitive function after refusing to submit to a drug test required by this appendix or receiving a verified positive drug test result on a test conducted under this appendix the individual shall undergo a drug test. No employer shall allow an individual required to undergo return to duty testing to perform a safety-sensitive function unless the employer has received a verified negative drug test result for the individual.

G. *Follow-up Testing.* 1. Each employer shall implement a reasonable program of unannounced testing of each individual who has been hired to perform or who has been returned to the performance of a safety-sensitive function after refusing to submit to a drug test required by this appendix or receiving a verified positive drug test result on a test conducted under this appendix.

2. The number and frequency of such testing shall be determined by the employer's Medical Review Officer. In the case of any individual evaluated under this appendix and determined to be in need of assistance in resolving problems associated with illegal use of drugs, follow-up testing shall consist of at least six tests in the first 12 months following the employee's return to duty.

3. The employer may direct the employee to undergo testing for alcohol, in addition to drugs, if the Medical Review Officer determines that alcohol testing is necessary for the particular employee. Any such alcohol testing shall be conducted in accordance with the provisions of 49 CFR part 40.

4. Follow-up testing shall not exceed 60 months after the date the individual begins to perform or returns to the performance of a safety-sensitive function. The Medical Review Officer may terminate the requirement for follow-up testing at any time after the first six tests have been conducted, if the Medical Review Officer determines that such testing is no longer necessary.

VI. *Administrative and Other Matters.* A. *Collection, Testing, and Rehabilitation Records.* Each employer shall maintain all records related to the collection process, including all logbooks and certification statements, for two years. Each employer shall maintain records of employee confirmed positive drug test results, SAP evaluations, and employee rehabilitation for five years. The employer shall maintain records of negative test results for 12 months. The employer shall permit the Administrator or the Administrator's representative to examine these records.

B. *Laboratory Inspections.* The employer shall contract only with a laboratory that permits pre-award inspections by the employer before the laboratory is awarded a testing contract and unannounced inspections, including examination of any and all records at any time by the employer, the Administrator, or the Administrator's representative.

C. *Employee Request for Test of a Split Specimen.* 1. Not later than 72 hours after receipt of notice of a verified positive test result, an employee may request that the MRO arrange for testing of the second, ''split'' specimen obtained during the collection of the primary specimen that resulted in the confirmed positive test result.

2. The split specimen shall be tested in accordance with the procedures in 49 CFR part 40.

3. The MRO shall not delay verification of the primary test result following a request for a split specimen test unless such delay is based on reasons other than the pendency of the split specimen test result. If the primary test result is verified as positive, actions required under this rule (e.g., notification to the Federal Air Surgeon, removal from safety-sensitive position) are not stayed during the 72-hour request period or pending receipt of the split specimen test result.

D. *Release of Drug Testing Information.* An employer shall release information regarding an employee's drug testing results, evaluation, or rehabilitation to a third party in accordance with the specific, written consent of the employee authorizing release of the information to an identified person, to the National Transportation Safety Board as part of an accident investigation upon written request or order, to the FAA upon request, or as required by this appendix. Except as required by law or this appendix, no employer shall release employee information.

E. *Refusal to Submit to Testing.* 1. Each employer shall notify the FAA within 5 working days of any employee who holds a certificate issued under part 61, part 63, or part 65 of this chapter who has refused to submit to a drug test required under this appendix. Notification should be sent to: Federal Aviation Administration, Office of Aviation Medicine,

Drug Abatement Division (AAM–800), 800 Independence Avenue, SW., Washington, DC 20591.

2. Employers are not required to notify the above office of refusals to submit to pre-employment or return to duty testing.

F. *Permanent Disqualification From Service.* An employee who has verified positive drug test results on two drug tests required by appendix I to part 121 of this chapter and conducted after September 19, 1994 is permanently precluded from performing for an employer the safety-sensitive duties the employee performed prior to the second drug test.

2. An employee who has engaged in prohibited drug use during the performance of a safety-sensitive function after September 19, 1994 is permanently precluded from performing that safety-sensitive function for an employer.

VII. *Medical Review Officer/Substance Abuse Professional.* The employer shall designate or appoint a Medical Review Officer (MRO) who shall be qualified in accordance with 49 CFR part 40 and shall perform the functions set forth in 49 CFR part 40 and this appendix. If the employer does not have a qualified individual on staff to serve as MRO, the employer may contract for the provision of MRO services as part of its drug testing program.

A. *MRO and Substance Abuse Professional Duties.* In addition to the functions delineated in 49 CFR part 40, the MRO shall perform the duties listed hereunder.

1. During the MRO's interview with an employee or applicant who has had a confirmed positive drug test result, the MRO shall inquire, and the individual must disclose, whether the individual holds an airman medical certificate issued under part 67 of this chapter or, if an applicant, would be required to hold such certificate in order to perform the duties of the position for which the applicant is applying.

2. The MRO must process employee requests for testing of split specimens in accordance with section VI, paragraph C, of this appendix.

3. The MRO shall advise each employee who receives a verified positive drug test result on or refuses to submit to a drug test required under this appendix of the resources available to the employee in evaluating and resolving problems associated with illegal use of drugs, including the names, addresses, and telephone numbers of substance abuse professionals (SAP) and counseling and treatment programs.

4. The MRO shall ensure that each employee who receives a verified positive drug test result on or refuses to submit to a drug test required under this appendix is evaluated by a SAP to determine if the employee is in need of assistance in resolving problems associated with illegal use of drugs. The MRO may perform this evaluation if the MRO is qualified as a SAP.

5. Prior to recommending that an employee be returned to the performance of a safety-sensitive function after the employee has received a verified positive drug test result on or refused to submit to a drug test required by this appendix, the MRO shall—

a. Ensure that an employee returning to the performance of a safety-sensitive function has received a return to duty verified negative drug test result on a test conducted under section V., paragraph F of this appendix;

b. Ensure that each employee has been evaluated in accordance with section VII, paragraph A.4 of this appendix; and

c. Ensure that the employee demonstrates compliance with any rehabilitation program recommended following the evaluation required under section VII, paragraph A.4 of this appendix.

6. Prior to recommending that an individual be hired to perform a safety-sensitive function after such individual has received a verified positive drug test result on a pre-employment test or has refused to submit to a pre-employment drug test required by this appendix, the MRO shall—

a. Ensure that an individual has received a verified negative drug test result on a subsequent pre-employment test conducted under section V, paragraph A, of this appendix;

b. Evaluate the individual (if the MRO is qualified to be a SAP), or have the individual evaluated by a SAP, for drug use or abuse; and

c. Ensure that the individual has complied with the requirements of any rehabilitation program in which the individual participated following the verified positive pre-employment drug test result or the refusal to submit to a pre-employment test.

7. The MRO shall not recommend that a person who fails to satisfy the requirements in section VII, paragraph A.5 or A.6 of this appendix be hired to perform or returned to duty to perform a safety-sensitive function.

B. *MRO Determinations.* In the case of an employee or applicant who holds an airman medical certificate issued under part 67 of this chapter, or who is or would be required to hold such certificate in order to perform a safety-sensitive function for an employer, the MRO shall take the following actions after verifying a positive drug test result.

1. In addition to the evaluation required in section VII, paragraph A.4 of this appendix, the MRO shall make a determination of probable drug dependence or nondependence as specified in part 67 of this chapter within 10 working days of verifying the test result. If the MRO is unable to make such a determination, he or she should so state in the individual's records.

2. If the MRO determines that an individual is nondependent, the MRO may recommend that the individual be returned to duty or hired to perform safety-sensitive functions subject to the requirements of section VII, paragraph A.5 of this appendix. If the MRO makes a determination of probable drug dependence or cannot make a dependency determination, the MRO shall not recommend that the individual be returned to duty unless and until such individual has been found nondependent by or has received a special issuance medical certificate from the Federal Air Surgeon.

3. After making the determinations in section VII, paragraphs B.1 and B.2 of this appendix, the MRO must forward the names of such individuals with identifying information, the determinations concerning dependence, SAP evaluation (if available), return to duty recommendations, and any supporting information to the Federal Air Surgeon within 12 working days after verifying the positive drug test result of such individuals.

4. All reports required under this section shall be forwarded to the Federal Air Surgeon, Office of Aviation Medicine, Federal Aviation Administration, Attn: Drug Abatement Division (AAM–800), 800 Independence Avenue, SW., Washington, DC 20591.

C. *MRO Records.* Each MRO shall maintain records concerning drug tests performed under this rule in accordance with the following provisions:

1. All records shall be maintained in confidence and shall be released only in accordance with the provisions of this rule and 49 CFR part 40.

2. Records concerning drug tests confirmed positive by the laboratory shall be maintained for 5 years. Such records include the MRO copies of the custody and control form, medical interviews, documentation of the basis for verifying as negative test results confirmed as positive by the laboratory, any other documentation concerning the MRO's verification process, and copies of dependency determinations where applicable.

3. Records of confirmed negative test results shall be maintained for 12 months.

4. All records maintained pursuant to this rule by each MRO are subject to examination by the Administrator or the Administrator's representative at any time.

5. Should the employer change MROs for any reason, the employer shall ensure that the former MRO forwards all records maintained pursuant to this rule to the new MRO within 10 working days of receiving notice from the employer of the new MRO's name and address.

6. Any employer obtaining MRO services by contract, including a contract through a consortium, shall ensure that the contract includes a recordkeeping provision that is consistent with this paragraph, including requirements for transferring records to a new MRO.

D. *Evaluations and Referrals.* Each employer shall ensure that a substance abuse professional, including an MRO if he/she is qualified as a substance abuse professional, who determines that a covered employee requires assistance in resolving problems associated with illegal use of drugs does not refer the employee to the substance abuse professional's private practice or to a person or organization from which the substance abuse professional receives remuneration or in which the substance abuse professional has a financial interest. This paragraph does not prohibit a substance abuse professional from referring an employee for assistance provided through—

1. A public agency, such as a State, county, or municipality;

2. The employer or a person under contract to provide treatment for drug problems on behalf of the employer;

3. The sole source of therapeutically appropriate treatment under the employee's health insurance program; or

4. The sole source of therapeutically appropriate treatment reasonably accessible to the employee.

VIII. *Employee Assistance Program (EAP).* The employer shall provide an EAP for employees. The employer may establish the EAP as a part of its internal personnel services or the employer may contract with an entity that will provide EAP services to an employee. Each EAP must include education and training on drug use for employees and training for supervisors making determinations for testing of employees based on reasonable cause.

A. *EAP Education Program.* Each EAP education program must include at least the following elements: display and distribution of informational material; display and distribution of a community service hot-line telephone number for employee assistance; and display and distribution of the employer's policy regarding drug use in the workplace. The employer's policy shall include information regarding the consequences under the rule of using drugs while performing safety-sensitive functions, receiving a verified positive drug test result, or refusing to submit to a drug test required under the rule.

B. *EAP Training Program.* Each employer shall implement a reasonable program of initial training for employees. The employee training program must include at least the following elements: The effects and consequences of drug use on personal health, safety, and work environment; the manifestations and behavioral cues that may indicate drug use and abuse; and documentation of training given to employees and employer's supervisory personnel. The employer's supervisory personnel who will determine when an employee is subject to testing

based on reasonable cause shall receive specific training on specific, contemporaneous physical, behavioral, and performance indicators of probable drug use in addition to the training specified above. The employer shall ensure that supervisors who will make reasonable cause determinations receive at least 60 minutes of initial training. The employer shall implement a reasonable recurrent training program for supervisory personnel making reasonable cause determinations during subsequent years. The employer shall identify the employee and supervisor EAP training in the employer's drug testing plan submitted to the FAA for approval.

IX. *Employer's Antidrug Program Plan.* A. *Schedule for Submission of Plans and Implementation.* 1. Each employer shall submit an antidrug program plan to the Federal Aviation Administration, Office of Aviation Medicine, Drug Abatement Division (AAM–800), 800 Independence Avenue, SW., Washington, DC 20591.

2. (a) Any person who applies for a certificate under the provisions of part 121 or part 135 of this chapter after September 19, 1994 shall submit an antidrug program plan to the FAA for approval and must obtain such approval prior to beginning operations under the certificate. The program shall be implemented not later than the date of inception of operations. Contractor employees to a new certificate holder must be subject to an FAA-approved antidrug program within 60 days of the implementation of the employer's program.

(b) Any person who intends to begin sightseeing operations as an operator under 14 CFR 135.1(c) after September 19, 1994 shall, not later than 60 days prior to the proposed initiation of such operations, submit an antidrug program plan to the FAA for approval. No operator may begin conducting sightseeing flights prior to receipt of approval; the program shall be implemented concurrently with the inception of operations. Contractor employees to a new operator must be subject to an FAA-approved program within 60 days of the implementation of the employer's program.

(c) Any person who intends to begin air traffic control operations as an employer as defined in 14 CFR 65.46(a)(2) (air traffic control facilities not operated by the FAA or by or under contract to the U.S. military) after September 19, 1994 shall, not later than 60 days prior to the proposed initiation of such operations, submit an antidrug program plan to the FAA for approval. No air traffic control facility may begin conducting air traffic control operations prior to receipt of approval; the program shall be implemented concurrently with the inception of operations. Contractor employees to a new air traffic control facility must be subject to an FAA-approved program within 60 days of the implementation of the facility's program.

3. In accordance with this appendix, an entity or individual that holds a repair station certificate issued by the FAA pursuant to part 145 of this chapter and employs individuals who perform a safety-sensitive function pursuant to a primary or direct contract with an employer or an operator may submit an antidrug program plan (specifying the procedures for complying with this appendix) to the FAA for approval. Each certificated repair station shall implement its approved antidrug program in accordance with its terms.

4. Any entity or individual whose employees perform safety-sensitive functions pursuant to a contract with an employer (as defined in section II of this appendix), and any consortium may submit an antidrug program plan to the FAA for approval on a form and in a manner prescribed by the Administrator.

(a) The plan shall specify the procedures that will be used to comply with the requirements of this appendix.

(b) Each consortium program must provide for reporting changes in consortium membership to the FAA within 10 working days of such changes.

(c) Each contractor or consortium shall implement its antidrug program in accordance with the terms of its approved plan.

5. Each air traffic control facility operating under contract to the FAA shall submit an antidrug program plan to the FAA (specifying the procedures for all testing required by this appendix) not later than November 17, 1994. Each facility shall implement its antidrug program not later than 60 days after approval of the program by the FAA. Employees performing air traffic control duties by contract for the air traffic control facility (i.e., not directly employed by the facility) must be subject to an FAA-approved antidrug program within 60 days of implementation of the air traffic control facility's program.

6. Each employer, or contractor company that has submitted an antidrug plan directly to the FAA, shall ensure that it is continuously covered by an FAA-approved antidrug program, and shall obtain appropriate approval from the FAA prior to changing programs (e.g., joining another carrier's program, joining a consortium, or transferring to another consortium).

B. An employer's antidrug plan must specify the methods by which the employer will comply with the testing requirements of this appendix. The plan must provide the name and address of the laboratory which has been selected by the employer for analysis of the specimens collected during the employer's antidrug testing program.

C. An employer's antidrug plan must specify the procedures and personnel the employer will use to ensure that a determination is made as to the veracity of test results

and possible legitimate explanations for an employee receiving a verified positive drug test result.

D. The employer shall consider its antidrug program to be approved by the Administrator, unless notified to the contrary by the FAA, within 60 days after submission of the plan to the FAA.

X. *Reporting of Antidrug Program Results*. A. Annual reports of antidrug program results shall be submitted to the FAA in the form and manner prescribed by the Administrator by March 15 of the succeeding calendar year for the prior calendar year (January 1 through December 31) in accordance with the provisions below.

1. Each part 121 certificate holder shall submit an annual report each year.

2. Each entity conducting an antidrug program under an FAA-approved antidrug plan, other than a part 121 certificate holder, that has 50 or more employees performing a safety-sensitive function on January 1 of any calendar year shall submit an annual report to the FAA for that calendar year.

3. The Administrator reserves the right to require that aviation employers not otherwise required to submit annual reports prepare and submit such reports to the FAA. Employers that will be required to submit annual reports under this provision will be notified in writing by the FAA.

B. Each report shall be submitted in the form and manner prescribed by the Administrator. No other form, including another DOT Operating Administration's form, is acceptable for submission to the FAA.

C. Each report shall be signed by the employer's antidrug program manager or other designated representative.

D. Each report with verified positive drug test results shall include all of the following informational elements:

1. Number of covered employees by employee category.

2. Number of covered employees affected by the antidrug rule of another operating administration identified and reported by number and employee category.

3. Number of specimens collected by type of test and employee category.

4. Number of positive drug test results verified by a Medical Review Officer (MRO) by type of test, type of drug, and employee category.

5. Number of negative drug test results reported by an MRO by type of test and employee category.

6. Number of persons denied a safety-sensitive position based on a verified positive pre-employment drug test result reported by an MRO.

7. Action taken following a verified positive drug test result(s), by type of action.

8. Number of employees returned to duty during the reporting period after having received a verified positive drug test result on or refused to submit to a drug test required under the FAA rule.

9. Number of employees by employee category with tests verified positive for multiple drugs by an MRO.

10. Number of employees who refused to submit to a drug test and the action taken in response to the refusal(s).

11. Number of covered employees who have received required initial training.

12. Number of supervisory personnel who have received required initial training.

13. Number of supervisors who have received required recurrent training.

E. Each report with only negative drug test results shall include all of the following informational elements. (This report may *only* be submitted by employers with *no* verified positive drug test results during the reporting year.)

1. Number of covered employees by employee category.

2. Number of covered employees affected by the antidrug rule of another operating administration identified and reported by number and employee category.

3. Number of specimens collected by type of test and employee category.

4. Number of negative tests reported by an MRO by type of test and employee category.

5. Number of employees who refused to submit to a drug test and the action taken in response to the refusal(s).

6. Number of employees returned to duty during the reporting period after having received a verified positive drug test result on or refused to submit to a drug test required under the FAA rule.

7. Number of covered employees who have received required initial training.

8. Number of supervisory personnel who have received required initial training.

9. Number of supervisors who have received required recurrent training.

F. An FAA-approved consortium may prepare reports on behalf of individual aviation employers for purposes of compliance with this reporting requirement. However, the aviation employer shall sign and submit such a report and shall remain responsible for ensuring the accuracy and timeliness of each report prepared on its behalf by a consortium.

XI. *Preemption*. A. The issuance of 14 CFR parts 65, 121, and 135 by the FAA preempts any state or local law, rule, regulation, order, or standard covering the subject matter of 14 CFR parts 65, 121, and 135, including but not limited to, drug testing of aviation personnel performing safety-sensitive functions.

B. The issuance of 14 CFR parts 65, 121, and 135 does not preempt provisions of state criminal law that impose sanctions for reckless conduct of an individual that leads to

actual loss of life, injury, or damage to property whether such provisions apply specifically to aviation employees or generally to the public.

XII. *Employees Located Outside the Territory of the United States.* A. No individual shall undergo a drug test required under the provisions of this appendix while located outside the territory of the United States.

1. Each employee who is assigned to perform safety-sensitive functions solely outside the territory of the United States shall be removed from the random testing pool upon the inception of such assignment.

2. Each covered employee who is removed from the random testing pool under this paragraph A shall be returned to the random testing pool when the employee resumes the performance of safety-sensitive functions wholly or partially within the territory of the United States.

B. The provisions of this appendix shall not apply to any person who performs a function listed in section III of this appendix by contract for an employer outside the territory of the United States.

[Amdt. 121–240, 59 FR 42928, Aug. 19, 1994; 59 FR 53869, Oct. 26, 1994, as amended at 59 FR 62226, Dec. 2, 1994; Amdt. 121–240, 59 FR 66672, Dec. 28, 1994; 61 FR 37224, July 17, 1996; 65 FR 18887, Apr. 10, 2000]

APPENDIX J TO PART 121—ALCOHOL MISUSE PREVENTION PROGRAM

This appendix contains the standards and components that must be included in an alcohol misuse prevention program required by this chapter.

I. GENERAL.

A. *Purpose.* The purpose of this appendix is to establish programs designed to help prevent accidents and injuries resulting from the misuse of alcohol by employees who perform safety-sensitive functions in aviation.

B. *Alcohol testing procedures.* Each employer shall ensure that all alcohol testing conducted pursuant to this appendix complies with the procedures set forth in 49 CFR part 40. The provisions of 49 CFR part 40 that address alcohol testing are made applicable to employers by this appendix.

C. *Definitions.*

As used in this appendix—

Accident means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and the time all such persons have disembarked, and in which any person suffers death or serious injury or in which the aircraft receives substantial damage.

Administrator means the Administrator of the Federal Aviation Administration or his or her designated representative.

Alcohol means the intoxicating agent in beverage alcohol, ethyl alcohol, or other low molecular weight alcohols, including methyl or isopropyl alcohol.

Alcohol concentration (or content) means the alcohol in a volume of breath expressed in terms of grams of alcohol per 210 liters of breath as indicated by an evidential breath test under this appendix.

Alcohol use means the consumption of any beverage, mixture, or preparation, including any medication, containing alcohol.

Confirmation test means a second test, following a screening test with a result 0.02 or greater, that provides quantitative data of alcohol concentration.

Consortium means an entity, including a group or association of employers or contractors, that provides alcohol testing as required by this appendix and that acts on behalf of such employers or contractors, provided that it has submitted an alcohol misuse prevention program certification statement to the FAA in accordance with this appendix.

Contractor company means a company that has employees who perform safety-sensitive functions by contract for an employer.

Covered employee means a person who performs, either directly or by contract, a safety-sensitive function listed in section II of this appendix for an employer (as defined below). For purposes of pre-employment testing only, the term ''covered employee'' includes a person applying to perform a safety-sensitive function.

DOT agency means an agency (or ''operating administration'') of the United States Department of Transportation administering regulations requiring alcohol testing (14 CFR parts 65, 121, and 135; 49 CFR parts 199, 219, and 382) in accordance with 49 CFR part 40.

Employer means a part 121 certificate holder; a part 135 certificate holder; an air traffic control facility not operated by the FAA or by or under contract to the U.S. military; and an operator as defined in 14 CFR 135.1(c).

Performing (a safety-sensitive function): an employee is considered to be performing a safety-sensitive function during any period in which he or she is actually performing, ready to perform, or immediately available to perform such functions.

Refuse to submit (to an alcohol test) means that a covered employee fails to provide adequate breath for testing without a valid medical explanation after he or she has received notice of the requirement to be tested in accordance with this appendix, or engages in conduct that clearly obstructs the testing process.

Safety-sensitive function means a function listed in section II of this appendix.

Screening test means an analytical procedure to determine whether a covered employee may have a prohibited concentration of alcohol in his or her system.

Violation rate means the number of covered employees (as reported under section IV of this appendix) found during random tests given under this appendix to have an alcohol concentration of 0.04 or greater plus the number of employees who refused a random test required by this appendix, divided by the total reported number of employees in the industry given random alcohol tests under this appendix plus the total reported number of employees in the industry who refuse a random test required by this appendix.

D. *Preemption of State and local laws.*

1. Except as provided in subparagraph 2 of this paragraph, these regulations preempt any State or local law, rule, regulation, or order to the extent that:

(a) Compliance with both the State or local requirement and this appendix is not possible; or

(b) Compliance with the State or local requirement is an obstacle to the accomplishment and execution of any requirement in this appendix.

2. The alcohol misuse requirements of this title shall not be construed to preempt provisions of State criminal law that impose sanctions for reckless conduct leading to actual loss of life, injury, or damage to property, whether the provisions apply specifically to transportation employees or employers or to the general public.

E. *Other requirements imposed by employers.*

Except as expressly provided in these alcohol misuse requirements, nothing in these requirements shall be construed to affect the authority of employers, or the rights of employees, with respect to the use or possession of alcohol, including any authority and rights with respect to alcohol testing and rehabilitation.

F. *Requirement for notice.*

Before performing an alcohol test under this appendix, each employer shall notify a covered employee that the alcohol test is required by this appendix. No employer shall falsely represent that a test is administered under this appendix.

II. Covered Employees

Each employee who performs a function listed in this section directly or by contract for an employer as defined in this appendix must be subject to alcohol testing under an FAA-approved alcohol misuse prevention program implemented in accordance with this appendix. The covered safety-sensitive functions are:

1. Flight crewmember duties.
2. Flight attendant duties.
3. Flight instruction duties.
4. Aircraft dispatcher duties.
5. Aircraft maintenance or preventive maintenance duties.
6. Ground security coordinator duties.
7. Aviation screening duties.
8. Air traffic control duties.

III. Tests Required

A. Pre-employment

1. Prior to the first time a covered employee performs safety-sensitive functions for an employer, the employee shall undergo testing for alcohol. No employer shall allow a covered employee to perform safety-sensitive functions unless the employee has been administered an alcohol test with a result indicating an alcohol concentration less than 0.04. If a pre-employment test result under this paragraph indicates an alcohol concentration of 0.02 or greater but less than 0.04, the provisions of paragraph F of section V of this appendix apply.

2. An employer is not required to administer an alcohol test as required by this paragraph if:

(a) The employee has undergone an alcohol test required by this appendix or the alcohol misuse rule of another DOT agency under 49 CFR part 40 within the previous 6 months, with a result indicating an alcohol concentration less than 0.04; and

(b) The employer ensures that no prior employer of the covered employee of whom the employer has knowledge has records of a violation of §65.46a, 121.458, or 135.253 of this chapter or the alcohol misuse rule of another DOT agency within the previous 6 months.

B. Post-accident

1. As soon as practicable following an accident, each employer shall test each surviving covered employee for alcohol if that employee's performance of a safety-sensitive function either contributed to the accident or cannot be completely discounted as a contributing factor to the accident. The decision not to administer a test under this section shall be based on the employer's determination, using the best available information at the time of the determination, that the covered employee's performance could not have contributed to the accident.

2. (a) If a test required by this section is not administered within 2 hours following the accident, the employer shall prepare and maintain on file a record stating the reasons the test was not promptly administered. If a test required by this section is not administered within 8 hours following the accident, the employer shall cease attempts to administer an alcohol test and shall prepare and maintain the same record. Records shall be submitted to the FAA upon request of the Administrator or his or her designee.

(b) For the years stated in this paragraph, employers who submit MIS reports shall submit to the FAA each record of a test required by this section that is not completed within 8 hours. The employer's records of tests that are not completed within 8 hours shall be submitted to the FAA by March 15, 1996; March 15, 1997; and March 15, 1998; for

calendar years 1995, 1996, and 1997, respectively. Employers shall append these records to their MIS submissions. Each record shall include the following information:

(i) Type of test (reasonable suspicion/post-accident);

(ii) Triggering event (including date, time, and location);

(iii) Employee category (do not include employee name or other identifying information);

(iv) Reason(s) test could not be completed within 8 hours; and

(v) If blood alcohol testing could have been completed within eight hours, the name, address, and telephone number of the testing site where blood testing could have occurred.

3. A covered employee who is subject to post-accident testing shall remain readily available for such testing or may be deemed by the employer to have refused to submit to testing. Nothing in this section shall be construed to require the delay of necessary medical attention for injured people following an accident or to prohibit a covered employee from leaving the scene of an accident for the period necessary to obtain assistance in responding to the accident or to obtain necessary emergency medical care.

C. Random testing

1. Except as provided in paragraphs 2–4 of this section, the minimum annual percentage rate for random alcohol testing will be 25 percent of the covered employees.

2. The Administrator's decision to increase or decrease the minimum annual percentage rate for random alcohol testing is based on the violation rate for the entire industry. All information used for this determination is drawn from alcohol MIS reports required by this appendix. In order to ensure reliability of the data, the Administrator considers the quality and completeness of the reported data, may obtain additional information or reports from employers, and may make appropriate modifications in calculating the industry violation rate. Each year, the Administrator will publish in the FEDERAL REGISTER the minimum annual percentage rate for random alcohol testing of covered employees. The new minimum annual percentage rate for random alcohol testing will be applicable starting January 1 of the calendar year following publication.

3. (a) When the minimum annual percentage rate for random alcohol testing is 25 percent or more, the Administrator may lower this rate to 10 percent of all covered employees if the Administrator determines that the data received under the reporting requirements of this appendix for two consecutive calendar years indicate that the violation rate is less than 0.5 percent.

(b) When the minimum annual percentage rate for random alcohol testing is 50 percent, the Administrator may lower this rate to 25 percent of all covered employees if the Administrator determines that the data received under the reporting requirements of this appendix for two consecutive calendar years indicate that the violation rate is less than 1.0 percent but equal to or greater than 0.5 percent.

4. (a) When the minimum annual percentage rate for random alcohol testing is 10 percent, and the data received under the reporting requirements of this appendix for that calendar year indicate that the violation rate is equal to or greater than 0.5 percent but less than 1.0 percent, the Administrator will increase the minimum annual percentage rate for random alcohol testing to 25 percent of all covered employees.

(b) When the minimum annual percentage rate for random alcohol testing is 25 percent or less, and the data received under the reporting requirements of this appendix for that calendar year indicate that the violation rate is equal to or greater than 1.0 percent, the Administrator will increase the minimum annual percentage rate for random alcohol testing to 50 percent of all covered employees.

5. The selection of employees for random alcohol testing shall be made by a scientifically valid method, such as a random-number table or a computer-based random number generator that is matched with employees' Social Security numbers, payroll identification numbers, or other comparable identifying numbers. Under the selection process used, each covered employee shall have an equal chance of being tested each time selections are made.

6. The employer shall randomly select a sufficient number of covered employees for testing during each calendar year to equal an annual rate not less than the minimum annual percentage rate for random alcohol testing determined by the Administrator. If the employer conducts random testing through a consortium, the number of employees to be tested may be calculated for each individual employer or may be based on the total number of covered employees who are subject to random alcohol testing at the same minimum annual percentage rate under this appendix or any DOT alcohol testing rule.

7. Each employer shall ensure that random alcohol tests conducted under this appendix are unannounced and that the dates for administering random tests are spread reasonably throughout the calendar year.

8. Each employer shall require that each covered employee who is notified of selection for random testing proceeds to the testing site immediately; provided, however, that if the employee is performing a safety-sensitive function at the time of the notification, the employer shall instead ensure that the employee ceases to perform the safety-

sensitive function and proceeds to the testing site as soon as possible.

9. A covered employee shall only be randomly tested while the employee is performing safety-sensitive functions; just before the employee is to perform safety-sensitive functions; or just after the employee has ceased performing such functions.

10. If a given covered employee is subject to random alcohol testing under the alcohol testing rules of more than one DOT agency, the employee shall be subject to random alcohol testing at the percentage rate established for the calendar year by the DOT agency regulating more than 50 percent of the employee's functions.

11. If an employer is required to conduct random alcohol testing under the alcohol testing rules of more than one DOT agency, the employer may—

(a) Establish separate pools for random selection, with each pool containing the covered employees who are subject to testing at the same required rate; or

(b) Randomly select such employees for testing at the highest percentage rate established for the calendar year by any DOT agency to which the employer is subject.

D. Reasonable Suspicion Testing

1. An employer shall require a covered employee to submit to an alcohol test when the employer has reasonable suspicion to believe that the employee has violated the alcohol misuse prohibitions in §65.46a, 121.458, or 135.253 of this chapter.

2. The employer's determination that reasonable suspicion exists to require the covered employee to undergo an alcohol test shall be based on specific, contemporaneous, articulable observations concerning the appearance, behavior, speech or body odors of the employee. The required observations shall be made by a supervisor who is trained in detecting the symptoms of alcohol misuse. The supervisor who makes the determination that reasonable suspicion exists shall not conduct the breath alcohol test on that employee.

3. Alcohol testing is authorized by this section only if the observations required by paragraph 2 are made during, just preceding, or just after the period of the work day that the covered employee is required to be in compliance with this rule. An employee may be directed by the employer to undergo reasonable suspicion testing for alcohol only while the employee is performing safety-sensitive functions; just before the employee is to perform safety-sensitive functions; or just after the employee has ceased performing such functions.

4. (a) If a test required by this section is not administered within 2 hours following the determination made under paragraph 2 of this section, the employer shall prepare and maintain on file a record stating the reasons the test was not promptly administered. If a test required by this section is not administered within 8 hours following the determination made under paragraph 2 of this section, the employer shall cease attempts to administer an alcohol test and shall state in the record the reasons for not administering the test.

(b) For the years stated in this paragraph, employers who submit MIS reports shall submit to the FAA each record of a test required by this section that is not completed within 8 hours. The employer's records of tests that are not completed within 8 hours shall be submitted to the FAA by March 15, 1996; March 15, 1997; and March 15, 1998; for calendar years 1995, 1996, and 1997, respectively. Employers shall append these records to their MIS submissions. Each record shall include the following information:

(i) Type of test (reasonable suspicion/post-accident);

(ii) Triggering event (including date, time, and location);

(iii) Employee category (do *not* include employee name or other identifying information);

(iv) Reason(s) test could not be completed within 8 hours; and

(v) If blood alcohol testing could have been completed within eight hours, the name, address, and telephone number of the testing site where blood testing could have occurred.

(c) Notwithstanding the absence of a reasonable suspicion alcohol test under this section, no covered employee shall report for duty or remain on duty requiring the performance of safety-sensitive functions while the employee is under the influence of or impaired by alcohol, as shown by the behavioral, speech, or performance indicators of alcohol misuse, nor shall an employer permit the covered employee to perform or continue to perform safety-sensitive functions until:

(1) An alcohol test is administered and the employee's alcohol concentration measures less than 0.02; or

(2) The start of the employee's next regularly scheduled duty period, but not less than 8 hours following the determination made under paragraph 2 of this section that there is reasonable suspicion that the employee has violated the alcohol misuse provisions in §65.46a, 121.458, or 135.253 of this chapter.

(d) Except as provided in paragraph 4(b), no employer shall take any action under this appendix against a covered employee based solely on the employee's behavior and appearance in the absence of an alcohol test. This does not prohibit an employer with authority independent of this appendix from taking any action otherwise consistent with law.

E. Return to Duty Testing

Each employer shall ensure that before a covered employee returns to duty requiring the performance of a safety-sensitive function after engaging in conduct prohibited in §65.46a, 121.458, or 135.253 of this chapter, the employee shall undergo a return to duty alcohol test with a result indicating an alcohol concentration of less than 0.02.

F. Follow-up Testing

Following a determination under section VI, paragraph C.2 of this appendix that a covered employee is in need of assistance in resolving problems associated with alcohol misuse, each employer shall ensure that the employee is subject to unannounced follow-up alcohol testing as directed by a substance abuse professional in accordance with the provisions of section VI, paragraph C.3(b)(2) of this appendix. A covered employee shall be tested under this paragraph only while the employee is performing safety-sensitive functions; just before the employee is to perform safety-sensitive functions; or just after the employee has ceased performing such functions.

G. Retesting of Covered Employees With an Alcohol Concentration of 0.02 or Greater but Less Than 0.04

Each employer shall retest a covered employee to ensure compliance with the provisions of section V, paragraph F of this appendix, if the employer chooses to permit the employee to perform a safety-sensitive function within 8 hours following the administration of an alcohol test indicating an alcohol concentration of 0.02 or greater but less than 0.04.

IV. HANDLING OF TEST RESULTS, RECORD RETENTION, AND CONFIDENTIALITY

A. Retention of Records

1. *General Requirement.* Each employer shall maintain records of its alcohol misuse prevention program as provided in this section. The records shall be maintained in a secure location with controlled access.

2. *Period of Retention.* Each employer shall maintain the records in accordance with the following schedule:

(a) *Five years.* Records of employee alcohol test results with results indicating an alcohol concentration of 0.02 or greater, records related to other violations of §65.46a, 121.458, or 135.253 of this chapter, documentation of refusals to take required alcohol tests, calibration documentation, employee evaluations and referrals, and copies of any annual reports submitted to the FAA under this appendix shall be maintained for a minimum of 5 years.

(b) *Two years.* Records related to the collection process (except calibration of evidential breath testing devices) and training shall be maintained for a minimum of 2 years.

(c) *One year.* Records of all test results below 0.02 shall be maintained for a minimum of 1 year.

3. *Types of Records.* The following specific records shall be maintained.

(a) Records related to the collection process:

(1) Collection logbooks, if used.

(2) Documents relating to the random selection process.

(3) Calibration documentation for evidential breath testing devices.

(4) Documentation of breath alcohol technician training.

(5) Documents generated in connection with decisions to administer reasonable suspicion alcohol tests.

(6) Documents generated in connection with decisions on post-accident tests.

(7) Documents verifying existence of a medical explanation of the inability of a covered employee to provide adequate breath for testing.

(b) Records related to test results:

(1) The employer's copy of the alcohol test form, including the results of the test;

(2) Documents related to the refusal of any covered employee to submit to an alcohol test required by this appendix.

(3) Documents presented by a covered employee to dispute the result of an alcohol test administered under this appendix.

(c) Records related to other violations of §65.46a, 121.458, or 135.253 of this chapter.

(d) Records related to evaluations:

(1) Records pertaining to a determination by a substance abuse professional concerning a covered employee's need for assistance.

(2) Records concerning a covered employee's compliance with the recommendations of the substance abuse professional.

(3) Records of notifications to the Federal Air Surgeon of violations of the alcohol misuse prohibitions in this chapter by covered employees who hold medical certificates issued under part 67 of this chapter.

(e) Records related to education and training:

(1) Materials on alcohol misuse awareness, including a copy of the employer's policy on alcohol misuse.

(2) Documentation of compliance with the requirements of section VI, paragraph A of this appendix.

(3) Documentation of training provided to supervisors for the purpose of qualifying the supervisors to make a determination concerning the need for alcohol testing based on reasonable suspicion.

(4) Certification that any training conducted under this appendix complies with the requirements for such training.

B. Reporting of Results in a Management Information System

1. Annual reports summarizing the results of alcohol misuse prevention programs shall be submitted to the FAA in the form and manner prescribed by the Administrator by March 15 of each year covering the previous calendar year (January 1 through December 31) in accordance with the provisions below.

(a) Each part 121 certificate holder shall submit an annual report each year.

(b) Each entity conducting an alcohol misuse prevention program under the provisions of this appendix, other than a part 121 certificate holder, that has 50 or more covered employees on January 1 of any calendar year shall submit an annual report to the FAA for that calendar year.

(c) The Administrator reserves the right to require employers not otherwise required to submit annual reports to prepare and submit such reports to the FAA. Employers that will be required to submit annual reports under this provision will be notified in writing by the FAA.

2. Each employer that is subject to more than one DOT agency alcohol rule shall identify each employee covered by the regulations of more than one DOT agency. The identification will be by the total number and category of covered function. Prior to conducting any alcohol test on a covered employee subject to the rules of more than one DOT agency, the employer shall determine which DOT agency rule or rules authorizes or requires the test. The test result information shall be directed to the appropriate DOT agency or agencies.

3. Each employer shall ensure the accuracy and timeliness of each report submitted.

4. Each report shall be submitted in the form and manner prescribed by the Administrator.

5. Each report shall be signed by the employer's alcohol misuse prevention program manager or other designated representative.

6. Each report that contains information on an alcohol screening test result of 0.02 or greater or a violation of the alcohol misuse provisions of §65.46a, 121.458, or 135.253 of this chapter shall include the following informational elements:

(a) Number of covered employees by employee category.

(b) Number of covered employees in each category subject to alcohol testing under the alcohol misuse rule of another DOT agency, identified by each agency.

(c)(1) Number of screening tests by type of test and employee category.

(2) Number of confirmation tests, by type of test and employee category.

(d) Number of confirmation alcohol tests indicating an alcohol concentration of 0.02 or greater but less than 0.04 by type of test and employee category.

(e) Number of confirmation alcohol tests indicating an alcohol concentration of 0.04 or greater, by type of test and employee category.

(f) Number of persons denied a position as a covered employee following a pre-employment alcohol test indicating an alcohol concentration of 0.04 or greater.

(g) Number of covered employees with a confirmation alcohol test indicating an alcohol concentration of 0.04 or greater who were returned to duty in covered positions (having complied with the recommendations of a substance abuse professional as described in section V, paragraph E, and section VI, paragraph C of this appendix).

(h) Number of covered employees who were administered alcohol and drug tests at the same time, with both a positive drug test result and an alcohol test result indicating an alcohol concentration of 0.04 or greater.

(i) Number of covered employees who were found to have violated other alcohol misuse provisions of §65.46a, 121.458, or 135.253 of this chapter, and the action taken in response to the violation.

(j) Number of covered employees who refused to submit to an alcohol test required under this appendix, the number of such refusals that were for random tests, and the action taken in response to each refusal.

(k) Number of supervisors who have received required training during the reporting period in determining the existence of reasonable suspicion of alcohol misuse.

7. Each report with no screening test results of 0.02 or greater or violations of the alcohol misuse provisions of §65.46a, 121.458, or 135.253 of this chapter shall include the following informational elements. (This report may only be submitted if the program results meet these criteria.)

(a) Number of covered employees by employee category.

(b) Number of covered employees in each category subject to alcohol testing under the alcohol misuse rule of another DOT agency, identified by each agency.

(c) Number of screening tests by type of test and employee category.

(d) Number of covered employees who engaged in alcohol misuse who were returned to duty in covered positions (having complied with the recommendations of a substance abuse professional as described in section V, paragraph E, and section VI, paragraph C of this appendix).

(e) Number of covered employees who refused to submit to an alcohol test required under this appendix, and the action taken in response to each refusal.

(f) Number of supervisors who have received required training during the reporting period in determining the existence of reasonable suspicion of alcohol misuse.

8. An FAA-approved consortium may prepare reports on behalf of individual aviation

employers for purposes of compliance with this reporting requirement. However, the aviation employer shall sign and submit such a report and shall remain responsible for ensuring the accuracy and timeliness of each report prepared on its behalf by a consortium.

C. Access to Records and Facilities

1. Except as required by law or expressly authorized or required in this appendix, no employer shall release covered employee information that is contained in records required to be maintained under this appendix.

2. A covered employee is entitled, upon written request, to obtain copies of any records pertaining to the employee's use of alcohol, including any records pertaining to his or her alcohol tests. The employer shall promptly provide the records requested by the employee. Access to an employee's records shall not be contingent upon payment for records other than those specifically requested.

3. Each employer shall make available copies of all results of alcohol testing conducted under this appendix and any other information pertaining to the employer's alcohol misuse prevention program, when requested by the Secretary of Transportation or any DOT agency with regulatory authority over the employer or covered employee.

4. When requested by the National Transportation Safety Board as part of an accident investigation, each employer shall disclose information related to the employer's administration of a post-accident alcohol test administered following the accident under investigation.

5. Records shall be made available to a subsequent employer upon receipt of written request from the covered employee. Disclosure by the subsequent employer is permitted only as expressly authorized by the terms of the employee's request.

6. An employer may disclose information required to be maintained under this appendix pertaining to a covered employee to the employee or to the decisionmaker in a lawsuit, grievance, or other proceeding initiated by or on behalf of the individual and arising from the results of an alcohol test administered under this appendix or from the employer's determination that the employee engaged in conduct prohibited under §65.46a, 121.458, or 135.253 of this chapter (including, but not limited to, a worker's compensation, unemployment compensation, or other proceeding relating to a benefit sought by the employee).

7. An employer shall release information regarding a covered employee's records as directed by the specific, written consent of the employee authorizing release of the information to an identified person. Release of such information by the person receiving the information is permitted only in accordance with the terms of the employee's consent.

8. Each employer shall permit access to all facilities utilized in complying with the requirements of this appendix to the Secretary of Transportation or any DOT agency with regulatory authority over the employer or any of its covered employees.

V. CONSEQUENCES FOR EMPLOYEES ENGAGING IN ALCOHOL-RELATED CONDUCT

A. Removal From Safety-sensitive Function

1. Except as provided in section VI of this appendix, no covered employee shall perform safety-sensitive functions if the employee has engaged in conduct prohibited by §65.46a, 121.458, or 135.253 of this chapter or an alcohol misuse rule of another DOT agency.

2. No employer shall permit any covered employee to perform safety-sensitive functions if the employer has determined that the employee has violated this paragraph.

B. Permanent Disqualification From Service

An employee who violates §65.46a(c), 121.458(c), or 135.253(c) of this chapter, or who engages in alcohol use that violates another alcohol misuse provision of §65.46a, 121.458, or 135.253 of this chapter and had previously engaged in alcohol use that violated the provisions of §65.46a, 121.458, or 135.253 of this chapter after becoming subject to such prohibitions is permanently precluded from performing for an employer the safety-sensitive duties the employee performed before such violation.

C. Notice to the Federal Air Surgeon

1. An employer who determines that a covered employee who holds an airman medical certificate issued under part 67 of this chapter has engaged in alcohol use that violated the alcohol misuse provisions of §65.46a, 121.458, or 135.253 of this chapter shall notify the Federal Air Surgeon within 2 working days.

2. Each such employer shall forward to the Federal Air Surgeon a copy of the report of any evaluation performed under the provisions of section VI of this appendix within 2 working days of the employer's receipt of the report.

3. All documents shall be sent to the Federal Air Surgeon, Office of Aviation Medicine, Federal Aviation Administration, Attn: Drug Abatement Division (AAM–800), 800 Independence Avenue, SW., Washington, DC 20591.

4. No covered employee who holds a part 67 airman medical certificate shall perform safety-sensitive duties for an employer following a violation until and unless the Federal Air Surgeon has recommended that the employee be permitted to perform such duties.

D. Notice of Refusals

1. Except as provided in subparagraph 2 of this paragraph D, each employer shall notify the FAA within 5 working days of any covered employee who holds a certificate issued under 14 CFR part 61, part 63, or part 65 who has refused to submit to an alcohol test required under this appendix. Notifications should be sent to: Federal Aviation Administration, Office of Aviation Medicine, Drug Abatement Division (AAM–800), 800 Independence Avenue, SW., Washington, DC 20591.

2. An employer is not required to notify the above office of refusals to submit to preemployment alcohol tests or refusals to submit to return to duty tests.

E. Required Evaluation and Testing

No covered employee who has engaged in conduct prohibited by §65.46a, 121.458, or 135.253 of this chapter shall perform safety-sensitive functions unless the employee has met the requirements of section VI, paragraph C of this appendix. No employer shall permit a covered employee who has engaged in such conduct to perform safety-sensitive functions unless the employee has met the requirements of section VI, paragraph C of this appendix.

F. Other Alcohol-Related Conduct

1. No covered employee tested under the provisions of section III of this appendix who is found to have an alcohol concentration of 0.02 or greater but less than 0.04 shall perform or continue to perform safety-sensitive functions for an employer, nor shall an employer permit the employee to perform or continue to perform safety-sensitive functions, until:

(a) The employee's alcohol concentration measures less than 0.02; or

(b) The start of the employee's next regularly scheduled duty period, but not less than 8 hours following administration of the test.

2. Except as provided in subparagraph 1 of this paragraph, no employer shall take any action under this rule against an employee based solely on test results showing an alcohol concentration less than 0.04. This does not prohibit an employer with authority independent of this rule from taking any action otherwise consistent with law.

VI. Alcohol Misuse Information, Training, and Referral

A. Employer Obligation to Promulgate a Policy on the Misuse of Alcohol

1. *General requirements.* Each employer shall provide educational materials that explain these alcohol misuse requirements and the employer's policies and procedures with respect to meeting those requirements.

(a) The employer shall ensure that a copy of these materials is distributed to each covered employee prior to the start of alcohol testing under the employer's FAA-mandated alcohol misuse prevention program and to each person subsequently hired for or transferred to a covered position.

(b) Each employer shall provide written notice to representatives of employee organizations of the availability of this information.

2. *Required content.* The materials to be made available to employees shall include detailed discussion of at least the following:

(a) The identity of the person designated by the employer to answer employee questions about the materials.

(b) The categories of employees who are subject to the provisions of these alcohol misuse requirements.

(c) Sufficient information about the safety-sensitive functions performed by those employees to make clear what period of the work day the covered employee is required to be in compliance with these alcohol misuse requirements.

(d) Specific information concerning employee conduct that is prohibited by this chapter.

(e) The circumstances under which a covered employee will be tested for alcohol under this appendix.

(f) The procedures that will be used to test for the presence of alcohol, protect the employee and the integrity of the breath testing process, safeguard the validity of the test results, and ensure that those results are attributed to the correct employee.

(g) The requirement that a covered employee submit to alcohol tests administered in accordance with this appendix.

(h) An explanation of what constitutes a refusal to submit to an alcohol test and the attendant consequences.

(i) The consequences for covered employees found to have violated the prohibitions in this chapter, including the requirement that the employee be removed immediately from performing safety-sensitive functions, and the procedures under section VI of this appendix.

(j) The consequences for covered employees found to have an alcohol concentration of 0.02 or greater but less than 0.04.

(k) Information concerning the effects of alcohol misuse on an individual's health, work, and personal life; signs and symptoms of an alcohol problem; and available methods of evaluating and resolving problems associated with the misuse of alcohol; and intervening when an alcohol problem is suspected, including confrontation, referral to any available employee assistance program, and/or referral to management.

(l) *Optional provisions.* The materials supplied to covered employees may also include information on additional employer policies

with respect to the use or possession of alcohol, including any consequences for an employee found to have a specified alcohol level, that are based on the employer's authority independent of this appendix. Any such additional policies or consequences must be clearly and obviously described as being based on independent authority.

B. Training for Supervisors

Each employer shall ensure that persons designated to determine whether reasonable suspicion exists to require a covered employee to undergo alcohol testing under section II of this appendix receive at least 60 minutes of training on the physical, behavioral, speech, and performance indicators of probable alcohol misuse.

C. Referral, Evaluation, and Treatment

1. Each covered employee who has engaged in conduct prohibited by §65.46a, 121.458, or 135.253 of this chapter shall be advised by the employer of the resources available to the employee in evaluating and resolving problems associated with the misuse of alcohol, including the names, addresses, and telephone numbers of substance abuse professionals and counseling and treatment programs.

2. Each covered employee who engages in conduct prohibited under §65.46a, 121.458, or 135.253 of this chapter shall be evaluated by a substance abuse professional who must determine what assistance, if any, the employee needs in resolving problems associated with alcohol misuse.

3. (a) Before a covered employee returns to duty requiring the performance of a safety-sensitive function after engaging in conduct prohibited by §65.46a, 121.458, or 135.253 of this chapter, the employee shall undergo a return-to-duty alcohol test with a result indicating an alcohol concentration of less than 0.02.

(b) In addition, each covered employee identified as needing assistance in resolving problems associated with alcohol misuse—

(i) Shall be evaluated by a substance abuse professional to determine whether the employee has properly followed any rehabilitation program prescribed under subparagraph 2 of this paragraph, and,

(ii) Shall be subject to unannounced follow-up alcohol tests administered by the employer following the employee's return to duty. The number and frequency of such follow-up testing shall be determined by a substance abuse professional, but shall consist of at least six tests in the first 12 months following the employee's return to duty. The employer may direct the employee to undergo testing for drugs (both return to duty and follow-up), in addition to alcohol testing, if the substance abuse professional determines that drug testing is necessary for the particular employee. Any such drug testing shall be conducted in accordance with the requirements of 49 CFR part 40. Follow-up testing shall not exceed 60 months from the date of the employee's return to duty. The substance abuse professional may terminate the requirement for follow-up testing at any time after the first six tests have been administered, if the substance abuse professional determines that such testing is no longer necessary.

4. Evaluation and rehabilitation may be provided by the employer, by a substance abuse professional under contract with the employer, or by a substance abuse professional not affiliated with the employer. The choice of substance abuse professional and assignment of costs shall be made in accordance with employer/employee agreements and employer policies.

5. Each employer shall ensure that a substance abuse professional who determines that a covered employee requires assistance in resolving problems with alcohol misuse does not refer the employee to the substance abuse professional's private practice or to a person or organization from which the substance abuse professional receives remuneration or in which the substance abuse professional has a financial interest. This paragraph does not prohibit a substance abuse professional from referring an employee for assistance provided through—

(a) A public agency, such as a State, county, or municipality;

(b) The employer or a person under contract to provide treatment for alcohol problems on behalf of the employer;

(c) The sole source of therapeutically appropriate treatment under the employee's health insurance program; or

(d) The sole source of therapeutically appropriate treatment reasonably accessible to the employee.

6. The requirements of this paragraph with respect to referral, evaluation, and rehabilitation do not apply to applicants who refuse to submit to pre-employment testing or have a pre-employment test with a result indicating an alcohol concentration of 0.04 or greater.

VII. Employer's Alcohol Misuse Prevention Program

A. Schedule for Submission of Certification Statements and Implementation

1. Each employer shall submit an alcohol misuse prevention program (AMPP) certification statement as prescribed in paragraph B of section VII of this appendix, in duplicate, to the Federal Aviation Administration, Office of Aviation Medicine, Drug Abatement Division (AAM–800), 800 Independence Avenue, SW., Washington, DC 20591, in accordance with the schedule below.

(a) Each employer that holds a part 121 certificate, each employer that holds a part 135 certificate and directly employs more than 50 covered employees, and each air traffic control facility affected by this rule shall submit a certification statement to the FAA by July 1, 1994. Each employer must implement an AMPP meeting the requirements of this appendix on January 1, 1995. Contractor employees to these employers must be subject to an AMPP meeting the requirements of this appendix by July 1, 1995.

(b) Each employer that holds a part 135 certificate and directly employs from 11 to 50 covered employees shall submit a certification statement to the FAA by January 1, 1995. Each employer must implement an AMPP meeting the requirements of this appendix on July 1, 1995. Contractor employees to these employers must be subject to an AMPP meeting the requirements of this appendix by January 1, 1996.

(c) Each employer that holds a part 135 certificate and directly employs ten or fewer covered employees, and each operator as defined in 14 CFR 135.1(c) shall submit a certification statement to the FAA by July 1, 1995. Each employer must implement an AMPP meeting the requirements of this appendix on January 1, 1996. Contractor employees to these employers must be subject to an AMPP meeting the requirements of this appendix by July 1, 1996.

2. A company providing covered employees by contract to employers may be authorized by the FAA to establish an AMPP under the auspices of this appendix by submitting a certification statement meeting the requirements of paragraph B of section VII of this appendix directly to the FAA. Each contractor company that establishes an AMPP shall implement its AMPP in accordance with the provisions of this appendix.

(a) The FAA may revoke its authorization in the case of any contractor company that fails to properly implement its AMPP.

(b) No employer shall use a contractor company's employee who is not subject to the employer's AMPP unless the employer has first determined that the employee is subject to the contractor company's FAA-mandated AMPP.

3. A consortium may be authorized to establish a consortium AMPP under the auspices of this appendix by submitting a certification statement meeting the requirements of paragraph B of section VII of this appendix directly to the FAA. Each consortium that so certifies shall implement the AMPP on behalf of the consortium members in accordance with the provisions of this appendix.

(a) The FAA may revoke its authorization in the case of any consortium that fails to properly implement the AMPP.

(b) Each employer that participates in an FAA-approved consortium remains individually responsible for ensuring compliance with the provisions of these alcohol misuse requirements and must maintain all records required under section IV of this appendix.

(c) Each consortium shall notify the FAA of any membership termination within 10 days of such termination.

4. Any person who applies for a certificate under the provisions of parts 121 or 135 of this chapter after the effective date of the final rule shall submit an alcohol misuse prevention program (AMPP) certification statement to the FAA prior to beginning operations pursuant to the certificate. The AMPP shall be implemented concurrently with beginning such operations or on the date specified in paragraph A.1. of this section, whichever is later. Contractor employees to a new certificate holder must be subject to an FAA-mandated AMPP within 180 days of the implementation of the employer's AMPP.

5. Any person who intends to begin air traffic control operations as an employer as defined in 14 CFR 65.46(a)(2) (air traffic control facilities not operated by the FAA or by or under contract to the U.S. military) after March 18, 1994 shall, not later than 60 days prior to the proposed initiation of such operations, submit an alcohol misuse prevention program certification statement to the FAA. The AMPP shall be implemented concurrently with the inception of operations or on the date specified in paragraph A.1 of this section, whichever is later. Contractor employees to a new air traffic control facility must be subject to an FAA-approved program within 180 days of the implementation of the facility's program.

6. Any person who intends to begin sightseeing operations as an operator under 14 CFR 135.1(c) after March 18, 1994 shall, not later than 60 days prior to the proposed initiation of such operations, submit an alcohol misuse prevention program (AMPP) certification statement to the FAA. The AMPP shall be implemented concurrently with the inception of operations or on the date specified in paragraph A.1 of this section, whichever is later. Contractor employees to a new operator must be subject to an FAA-mandated AMPP within 180 days of the implementation of the employer's AMPP.

7. The duplicate certification statement shall be annotated indicating receipt by the FAA and returned to the employer, contractor company, or consortium.

8. Each consortium that submits an AMPP certification statement to the FAA must receive actual notice of the FAA's receipt of the statement prior to performing services as an FAA-approved consortium under this appendix on behalf of employers or contractor companies.

9. Each employer, and each contractor company that submits a certification statement directly to the FAA, shall notify the FAA of any proposed change in status (*e.g.*, join a consortium or another carrier's program, change consortium, etc.) prior to the effective date of such change. The employer or contractor company must ensure that it is continuously covered by an FAA-mandated alcohol misuse prevention program.

B. Required Content of AMPP Certification Statements

1. Each AMPP certification statement submitted by an employer or a contractor company shall provide the following information:

(a) The name, address, and telephone number of the employer/contractor company and for the employer/contractor company AMPP manager;

(b) FAA operating certificate number (if applicable);

(c) The date on which the employer or contractor company will implement its AMPP;

(d) If the submitter is a consortium member, the identity of the consortium; and

(e) A statement signed by an authorized representative of the employer or contractor company certifying an understanding of and agreement to comply with the provisions of the FAA's alcohol misuse prevention regulations.

2. Each consortium certification statement shall provide the following information.

(a) The name, address, and telephone number of the consortium's AMPP manager;

(b) A list of the specific services the consortium will be providing in implementation of FAA-mandated AMPPs (e.g., random testing, SAP).

(c) A statement signed by an authorized representative of the consortium certifying an understanding of and agreement to comply with the provisions of the FAA's alcohol misuse prevention regulations.

VIII. EMPLOYEES LOCATED OUTSIDE THE U.S.

A. No covered employee shall be tested for alcohol misuse while located outside the territory of the United States.

1. Each covered employee who is assigned to perform safety-sensitive functions solely outside the territory of the United States shall be removed from the random testing pool upon the inception of such assignment.

2. Each covered employee who is removed from the random testing pool under this paragraph shall be returned to the random testing pool when the employee resumes the performance of safety-sensitive functions wholly or partially within the territory of the United States.

B. The provisions of this appendix shall not apply to any person who performs a safety-sensitive function by contract for an employer outside the territory of the United States.

[Amdt. 121–237, 59 FR 7390, Feb. 15, 1994, as amended at 59 FR 53086, Oct. 21, 1994; 59 FR 62238, 62239, Dec. 2, 1994; 59 FR 66672, Dec. 28, 1994; 61 FR 37224, July 17, 1996; 65 FR 18887, Apr. 10, 2000]

EFFECTIVE DATE NOTE: By Amdt. 121–237, 60 FR 24766, May 10, 1995, part 121, was amended by suspending appendix J, sec. III, subsection A (''Pre–employment''), effective May 10, 1995.

APPENDIX K TO PART 121—PERFORMANCE REQUIREMENTS FOR CERTAIN TURBOPROPELLER POWERED AIRPLANES

1. *Applicability*. This appendix specifies requirements for the following turbopropeller powered airplanes that must comply with the Airplane Performance Operating Limitations in §§121.189 through 121.197:

a. After December 20, 2010, each airplane manufactured before March 20, 1997 and type certificated in the:

i. Normal category before July 1, 1970, and meets special conditions issued by the Administrator for airplanes intended for use in operations under part 135 of this chapter.

ii. Normal category before July 19, 1970, and meets the additional airworthiness standards in SFAR No. 23 of 14 CFR part 23.

iii. Normal category, and complies with the additional airworthiness standards in appendix A of part 135 of this chapter.

iv. Normal category, and complies with section 1.(a) or 1.(b) of SFAR No. 41 of 14 CFR part 21.

b. After March 20, 1997, each airplane:

i. Type certificated prior to March 29, 1995, in the commuter category.

ii. Manufactured on or after March 20, 1997, and that was type certificated in the normal category, and complies with the requirements described in paragraphs 1.a.i through iii of this appendix.

2. *Background*. Sections 121.157 and 121.173(b) require that the airplanes operated under this part and described in paragraph 1 of this appendix, comply with the Airplane Performance Operating Limitations in §§121.189 through 121.197. Airplanes described in §121.157(f) and paragraph 1.a of this appendix must comply on and after December 20, 2010. Airplanes described in §121.157(e) and paragraph 1.b of this appendix must comply on and after March 20, 1997. (Airplanes type certificated in the normal category, and in accordance with SFAR No. 41 of 14 CFR part 21, as described in paragraph 1.a.iv of this appendix, may not be produced after October 17, 1991.)

3. *References*. Unless otherwise specified, references in this appendix to sections of part 23 of this chapter are to those sections

of 14 CFR part 23, as amended by Amendment No. 23–45 (August 6, 1993, 58 FR 42156).

Performance

4. *Interim Airplane Performance Operating Limitations.*

a. Until December 20, 2010, airplanes described in paragraph 1.a of this appendix may continue to comply with the requirements in subpart I of part 135 and §135.181(a)(2) of this chapter that apply to small, nontransport category airplanes.

b. Until March 20, 1997, airplanes described in paragraph 1.b.i of this appendix may continue to comply with the requirements in subpart I of part 135 of this chapter that apply to commuter category airplanes.

5. *Final Airplane Performance Operating Limitations.*

a. Through an amended type certification program or a supplemental type certification program, each airplane described in paragraph 1.a and 1.b.ii of this appendix must be shown to comply with the commuter category performance requirements specified in this appendix, which are included in part 23 of this chapter. Each new revision to a current airplane performance operating limitation for an airplane that is or has been demonstrated to comply, must also be approved by the Administrator. An airplane approved to the requirements of section 1.(b) of SFAR No. 41 of 14 CFR part 21, as described in paragraph 1.a.iv of this appendix, and that has been demonstrated to comply with the additional requirements of section 4.(c) of SFAR No. 41 of 14 CFR part 21 and International Civil Aviation Organization Annex 8 (available from the FAA, 800 Independence Avenue SW., Washington, DC 20591), will be considered to be in compliance with the commuter category performance requirements.

b. Each turbopropeller powered airplane subject to this appendix must be demonstrated to comply with the airplane performance operating limitation requirements of this chapter specified as follows:

i. Section 23.45 Performance General.

ii. Section 23.51 Takeoff.

iii. Section 23.53 Takeoff speeds.

iv. Section 23.55 Accelerate stop distance.

v. Section 23.57 Takeoff path.

vi. Section 23.59 Takeoff distance and takeoff run.

vii. Section 23.61 Takeoff flight path.

viii. Section 23.65 Climb: All engines operating.

ix. Section 23.67 Climb: one engine inoperative.

x. Section 23.75 Landing.

xi. Section 23.77 Balked landing.

xii. Sections 23.1581 through 23.1589 Airplane flight manual and approved manual material.

6. *Operation.* After compliance with the final airplane performance operating limitations requirements has been demonstrated and added to the Airplane Flight Manual performance data of the affected airplane, that airplane must be operated in accordance with the performance limitations of §§121.189 through 121.197.

[Doc. No. 28154, 60 FR 65936, Dec. 20, 1995]

APPENDIX L TO PART 121—TYPE CERTIFICATION REGULATIONS MADE PREVIOUSLY EFFECTIVE

Appendix L lists regulations in this part that require compliance with standards contained in superseded type certification regulations that continue to apply to certain transport category airplanes. The tables set out citations to current CFR section, applicable aircraft, superseded type certification regulation and applicable time periods, and the CFR edition and FEDERAL REGISTER documents where the regulation having prior effect is found. Copies of all superseded regulations may be obtained at the Federal Aviation Administration Law Library, Room 924, 800 Independence Avenue SW., Washington, DC.

Part 121 section	Applicable aircraft	Provisions: CFR/FR references
§121.312(a)(1)(i)	Transport category; or nontransport category type certificated before January 1, 1965; passenger capacity of 20 or more; manufactured prior to August 20, 1990.	Heat release rate testing. 14 CFR 25.853(d) in effect March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) in effect August 20, 1986: 14 CFR parts 1 to 59, Revised as of January 1, 1986.
§121.312(a)(1)(ii)	Transport category; or nontransport category type certificated before January 1, 1965; passenger capacity of 20 or more; manufactured after August 19, 1990.	Heat release rate and smoke testing. 14 CFR 25.853(d) in effect March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) in effect September 26, 1988: 14 CFR parts 1 to 59, Revised as of January 1, 1988, and amended by Amdt 25–66, 53 FR 32584, August 25, 1988

Part 121 section	Applicable aircraft	Provisions: CFR/FR references
§121.312(a)(2)(i)	Transport category; or nontransport category type certificate before January 1, 1965; application for type certificate filed prior to May 1, 1972; substantially complete replacement of cabin interior on or after May 1, 1972.	Provisions of 14 CFR 25.853 in effect on April 30, 1972: 14 CFR parts 1 to 59, Revised as of January 1, 1972.
§121.312(a)(3)(i)	Transport category type certificated after January 1, 1958; nontransport category type certificated after January 1, 1958, but before January 1, 1965; passenger capacity of 20 or more; substantially complete replacement of the cabin interior on or after March 6, 1995.	Heat release rate testing. 14 CFR 25.853(d) in effect March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995; and amended by Amdt 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) in effect August 20, 1986: 14 CFR parts 1 to 59, Revised as of January 1, 1986.
§121.312(a)(3)(ii)	Transport category type certificated after January 1, 1958; nontransport category type certificated after January 1, 1958, but before January 1, 1965; passenger capacity of 20 or more; substantially complete replacement of the cabin interior on or after August 20, 1990.	Heat release rate and smoke testing. 14 CFR 25.853(d) in effect March 6, 1995; 14 CFR parts 1 to 59, Revised as of January 1, 1995; and amended by Amdt 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR §25.853(a–1) in effect September 26, 1988: CFR, Title 14, Parts 1 to 59, Revised as of January 1, 1988, and amended by Amdt 25–66, 53 FR 32584, August 25, 1988.
§121.312(b) (1) and (2)	Transport category airplane type certificated after January 1, 1958; Nontransport category airplane type certificated after December 31, 1964.	Seat cushions. 14 CFR 25.853(c) effective on November 26, 1984: 14 CFR parts 1 to 59, Revised as of January 1, 1984, and amended by Amdt 25–59, 49 FR 43188, October 26, 1984.
§121.312(c)	Airplane type certificated in accordance with SFAR No. 41; maximum certificated takeoff weight in excess of 12,500 pounds.	Compartment interior requirements. 14 CFR 25.853(a) in effect March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a), (b–1), (b–2), and (b–3) in effect on September 26, 1978: 14 CFR parts 1 to 59, Revised as of January 1, 1978.
§121.314(a)	Transport category airplanes type certificated after January 1, 1958.	Class C or D cargo or baggage compartment definition, 14 CFR 25.857 in effect on June 16, 1986, 14 CFR parts 1 to 59, Revised 1/1/97, and amended by Amendment 25–60, 51 FR 18243, May 16, 1986.

[Doc. No. 28154, 60 FR 65936, Dec. 20, 1995, as amended by Amdt. 121–269, 63 FR 8049, Feb. 17, 1998]

APPENDIX M TO PART 121—AIRPLANE FLIGHT RECORDER SPECIFICATIONS

The recorded values must meet the designated range, resolution, and accuracy requirements during dynamic and static conditions. All data recorded must be correlated in time to within one second.

Parameters	Range	Accuracy (sensor input)	Seconds per sampling interval	Resolution	Remarks
1. Time or Relative Times Counts.[1].	24 Hrs, 0 to 4095.	+/−0.125% Per Hour.	4	1 sec	UTC time preferred when available. Count increments each 4 second of system operation.
2. Pressure Altitude.	−1000 ft to max certificated altitude of aircraft. +5000 ft.	+/−100 to +/−700 ft (see table, TSO C124a or TSO C51a).	1	5′ to 35′	Data should be obtained from the air data computer when practicable.
3. Indicated airspeed or Calibrated airspeed.	50 KIAS or minimum value to Max V_{so} to 1.2 V_D.	+/−5% and +/−3%.	1	1 kt	Data should be obtained from the air data computer when practicable.
4. Heading (Primary flight crew reference).	0–360° and Discrete ''true'' or ''mag''.	+/−2°	1	0.5°	When true or magnetic heading can be selected as the primary heading reference, a discrete indicating selection must be recorded.

The recorded values must meet the designated range, resolution, and accuracy requirements during dynamic and static conditions. All data recorded must be correlated in time to within one second.

Parameters	Range	Accuracy (sensor input)	Seconds per sampling interval	Resolution	Remarks
5. Normal Acceleration (Vertical).	−3g to +6g	+/−1% of max range excluding datum error of +/−5%.	0.125	0.004g	
6. Pitch Attitude	+/−75°	+/−2°	1 or 0.25 for airplanes operated under §121.344(f).	0.5°	A sampling rate of 0.25 is recommended.
7. Roll attitude[2]	+/−180°	+/−2°	1 or 0.5 for airplanes operated under §121.344(f).	0.5	A sampling rate of 0.5 is recommended.
8. Manual Radio Transmitter Keying or CVR/DFDR synchronization reference.	On-Off (Discrete) None		1		Preferably each crew member but one discrete acceptable for all transmission provided the CVR/FDR system complies with TSO C124a CVR synchronization requirements (paragraph 4.2.1 ED–55).
9. Thrust/Power on Each Engine—primary flight crew reference.[14].	Full Range Forward.	+/−2%	1 (per engine)	0.2% of full range.	Sufficient parameters (e.g. EPR, NI or Torque, NP) as appropriate to the particular engine be recorded to determine power in forward and reverse thrust, including potential overspeed condition.
10. Autopilot Engagement.	Discrete ''on'' or ''off''.		1		
11. Longitudinal Acceleration.	+/−1g	+/−1.5% max. range excluding datum error of +/−5%.	0.25	0.004g	
12a. Pitch Control(s) position (non-fly-by-wire systems.	Full Range	+/−2% Unless Higher Accuracy Uniquely Required.	0.5 or 0.25 for airplanes operated under §121.344(f).	0.2% of full range.	For airplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5 or 0.25, as applicable.
12b. Pitch Control(s) position (fly-by-wire systems).[3].	Full Range	+/−2° Unless Higher Accuracy Uniquely Required..	0.5 or 0.25 for airplanes operated under §121.344(f)..	0.2% of full range.	
13a. Lateral Control position(s) (non-fly-by-wire).	Full Range	+/−2° Unless Higher Accuracy Uniquely Required.	0.5 or 0.25 for airplanes operated under §121.344(f).	0.2% of full range.	For airplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5 or 0.25, as applicable.
13b. Lateral Control position(s) (fly-by-wire).[4].	Full Range	+/−2° Unless Higher Accuracy Uniquely Required.	0.5 or 0.25 for airplanes operated under §121.344(f).	0.2% of full range.	

The recorded values must meet the designated range, resolution, and accuracy requirements during dynamic and static conditions. All data recorded must be correlated in time to within one second.

Parameters	Range	Accuracy (sensor input)	Seconds per sampling interval	Resolution	Remarks
14a. Yaw Control position(s) (non-fly-by-wire).[5].	Full Range	+/−2° Unless Higher Accuracy Uniquely Required.	0.5	0.2% of full range.	For airplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5.
14b. Yaw Control position(s) (fly-by-wire).	Full Range	+/−2° Unless Higher Accuracy Uniquely Required.	0.5	0.2% of full range.	
15. Pitch Control Surface(s) Position.[6].	Full Range	+/−° Unless Higher Accuracy Uniquely Required.	0.5 or 0.25 for airplanes operated under §121.344(f).	0.2% of full range.	For airplanes fitted with multiple or split surfaces, a suitable combination of inputs is acceptable in lieu or recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5 or 0.25.
16. Lateral Control Surface(s) Position.[7].	Full Range	+/−2° Unless Higher Accuracy Uniquely Required.	0.5 or 0.25 for airplanes operated under §121.344(f).	0.2% of full range.	A suitable combination of surface position sensors is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5 or 0.25.
17. Yaw Control Surface(s) Position.[8].	Full Range	+/−2° Unless Higher Accuracy Uniquely Required.	0.5	0.2% of full range.	For airplanes with multiple or split surfaces, a suitable combination of surface position sensors is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sapling interval of 0.5.
18. Lateral Acceleration.	+/−1g	+/−1.5% max. range excluding datum error of +/−5%.	0.25	0.004g	
19. Pitch Trim Surface Position.[9].	Full Range	+/−3° Unless Higher Accuracy Uniquely Required.	1	0.3% of full range.	
20. Trailing Edge Flap or Cockpit Control Selection.[10].	Full Range or Each Position (discrete).	+/−3° or as Pilot's indicator.	2	0.5% of full range.	Flap position and cockpit control may each be sampled at 4 second intervals, to give a data point every 2 seconds.
21. Leading Edge Flap or Cockpit Control Selection.[11].	Full Range or Each Discrete Position.	+/−3° or as Pilot's indicator and sufficient to determine each discrete position.	2	0.5% of full range.	Left and right sides, or flap position and cockpit control may each be sampled at 4 second intervals, so as to give a data point every 2 seconds.
22. Each Thrust Reverser Position (or equivalent for propeller airplane).	Stowed, In Transit, and Reverse (Discrete).	.....	1 (per engine) ...	.....	Turbo-jet—2 discretes enable the 3 states to be determined. Turbo-prop—discrete.

The recorded values must meet the designated range, resolution, and accuracy requirements during dynamic and static conditions. All data recorded must be correlated in time to within one second.

Parameters	Range	Accuracy (sensor input)	Seconds per sampling interval	Resolution	Remarks
23. Ground Spoiler Position or Speed Brake Selection.[12].	Full Range or Each Position (discrete).	+/−2° Unless Higher Accuracy Uniquely Required.	1 or 0.5 for airplanes operated under §121.344(f).	0.2% of full range.	
24. Outside Air Temperature or Total Air Temperature.[13].	−50 °C to +90 °C.	+/−2 °C	2	0.3 °C	
25. Autopilot/ Autothrottle/ AFCS Mode and Engagement Status.	A suitable combination of discretes.		1		Discretes should show which systems are engaged and which primary modes are controlling the flight path and speed of the aircraft.
26. Radio Altitude	−20 ft to 2,500 ft.	+/−2 ft or +/−3% Whichever is Greater Below 500 ft and +/−5% Above 500 ft.	1	1 ft + 5% above 500 ft.	For autoland/category 3 operations. Each radio altimeter should be recorded, but arranged so that at least one is recorded each second.
27. Localizer Deviation, MLS Azimuth, or GPS Latitude Deviation.	+/−400 Microamps or available sensor range as installed. +/−62°	As installed +/−3% recommended.	1	0.3% of full range.	For autoland/category 3 operations. Each system should be recorded but arranged so that at least one is recorded each second. It is not necessary to record ILS and MLS at the same time, only the approach aid in use need be recorded.
28. Glideslope Deviation, MLS Elevation, or GPS Vertical Deviation.	+/−400 Microamps or available sensor range as installed 0.9 to +30°	As installed +/3−3% recommended.	1	0.3% of full range.	For autoland/category 3 operations. Each system should be recorded but arranged so that at least one is recorded each second. It is not necessary to record ILS and MLS at the same time, only the approach aid in use need be recorded.
29. Marker Beacon Passage.	Discrete ''on'' or ''off''.		1		A single discrete is acceptable for all markers.
30. Master Warning.	Discrete		1		Record the master warning and record each ''red'' warning that cannot be determined from other parameters or from the cockpit voice recorder.
31. Air/ground sensor (primary airplane system reference nose or main gear).	Discrete ''air'' or ''ground''.		1 (0.25 recommended).		
32. Angle of Attack (If measured directly).	As installed	As installed	2 or 0.5 for airplanes operated under §121.344(f).	0.3% of full range.	If left and right sensors are available, each may be recorded at 4 or 1 second intervals, as appropriate, so as to give a data point at 2 seconds or 0.5 second, as required.
33. Hydraulic Pressure Low, Each System.	Discrete or available sensor range, ''low'' or ''normal''.	+/−5%	2	0.5% of full range.	
34. Groundspeed	As Installed	Most Accurate Systems Installed.	1	0.2% of full range.	
35. GPWS (ground proximity warning system).	Discrete ''warning'' or ''off''.		1		A suitable combination of discretes unless recorder capacity is limited in which case a single discrete for all modes is acceptable.

The recorded values must meet the designated range, resolution, and accuracy requirements during dynamic and static conditions. All data recorded must be correlated in time to within one second.

Parameters	Range	Accuracy (sensor input)	Seconds per sampling interval	Resolution	Remarks
36. Landing Gear Position or Landing gear cockpit control selection.	Discrete		4		A suitable combination of discretes should be recorded.
37. Drift Angle.[15]	As installed	As installed	4	0.1°	
38. Wind Speed and Direction.	As installed	As installed	4	1 knot, and 1.0°.	
39. Latitude and Longitude.	As installed	As installed	4	0.002°, or as installed.	Provided by the Primary Navigation System Reference. Where capacity permits Latitude/longitude resolution should be 0.0002°.
40. Stick shaker and pusher activation.	Discrete(s) ''on'' or ''off''.		1		A suitable combination of discretes to determine activation.
41. Windshear Detection.	Discrete ''warning'' or ''off''.		1.		
42. Throttle/power Leverl position.[16].	Full Range	+/−2%	1 for each lever	2% of full range	For airplanes with non-mechanically linked cockpit engine controls.
43. Additional Engine Parameters.	As installed	As installed	Each engine each second.	2% of full range	Where capacity permits, the preferred priority is indicated vibration level, N2, EGT, Fuel Flow, Fuel Cutoff lever position and N3, unless engine manufacturer recommends otherwise.
44. Traffic Alert and Collision Avoidance System (TCAS).	Discretes	As installed	1		A suitable combination of discretes should be recorded to determine the status of—Combined Control, Vertical Control, Up Advisory, and Down Advisory. (ref. ARINC Characteristic 735 Attachment 6E, TCAS VERTICAL RA DATA OUTPUT WORD.)
45. DME 1 and 2 Distance.	0–200 NM	As installed	4	1 NM	1 mile
46. Nav 1 and 2 Selected Frequency.	Full Range	As installed	4		Sufficient to determine selected frequency
47. Selected barometric setting.	Full Range	+/−5%	(1 per 64 sec.)	0.2% of full range	
48. Selected Altitude.	Full Range	+/−5%	1	100 ft	
49. Selected speed.	Full Range	+/−5%	1	1 knot	
50. Selected Mach.	Full Range	+/−5%	1	.01	
51. Selected vertical speed.	Full Range	+/−5%	1	100 ft/min	
52. Selected heading.	Full Range	+/−5%	1	1°	
53. Selected flight path.	Full Range	+/−5%	1	1°	
54. Selected decision height.	Full Range	+/−5%	64	1 ft	
55. EFIS display format.	Discrete(s)		4		Discretes should show the display system status (e.g., off, normal, fail, composite, sector, plan, nav aids, weather radar, range, copy.

The recorded values must meet the designated range, resolution, and accuracy requirements during dynamic and static conditions. All data recorded must be correlated in time to within one second.

Parameters	Range	Accuracy (sensor input)	Seconds per sampling interval	Resolution	Remarks
56. Multi-function/ Engine Alerts Display format.	Discrete(s)	.....	4	.....	Discretes should show the display system status (e.g., off, normal, fail, and the identity of display pages for emergency procedures, need not be recorded.
57. Thrust command.[17].	Full Range	+/−2%	2	2% of full range.	
58. Thrust target	Full Range	+/−2%	4	2% of full range	
59. Fuel quantity in CG trim tank.	Full Range	+/−5%	(1 per 64 sec.) ..	1% of full range	
60. Primary Navigation System Reference.	Discrete GPS, INS, VOR/ DME, MLS, Loran C, Omega, Localizer Glideslope.	.....	4	.....	A suitable combination of discretes to determine the Primary Navigation System reference.
61. Ice Detection	Discrete ''ice'' or ''no ice''.	.....	4		
62. Engine warning each engine vibration.	Discrete	.....	1		
63. Engine warning each engine over temp.	Discrete	.....	1		
64. Engine warning each engine oil pressure low.	Discrete	.....	1		
65. Engine warning each engine over speed.	Discrete	.....	1		
66. Yaw Trim Surface Position.	Full Range	+/−3% Unless Higher Accuracy Uniquely Required.	2	0.3% of full range.	
67. Roll Trim Surface Position.	Full Range	+/−3% Unless Higher Accuracy Uniquely Required.	2	0.3% of full range.	
68. Brake Pressure (left and right).	As installed	+/−5%	1	.....	To determine braking effort applied by pilots or by autobrakes.
69. Brake Pedal Application (left and right).	Discrete or Analog ''applied'' or ''off''.	+/−5% (Analog)	1	.....	To determine braking applied by pilots.
70. Yaw or sideslip angle.	Full Range	+/−5%	1	0.5°	
71. Engine bleed valve position.	Discrete ''open'' or ''closed''.	.....	4		
72. De-icing or anti-icing system selection.	Discrete ''on'' or ''off''.	.....	4		
73. Computed center of gravity.	Full Range	+/−5%	(1 per 64 sec.) ..	1% of full range	
74. AC electrical bus status.	Discrete ''power'' or ''off''.	.....	4	.....	Each bus.
75. DC electrical bus status.	Discrete ''power'' or ''off''.	.....	4	.....	Each bus.
76 APU bleed valve position.	Discrete ''open'' or ''closed''.	.....	4		
77. Hydraulic Pressure (each system).	Full range	+/−5%	2	100 psi	
78. Loss of cabin pressure.	Discrete ''loss'' or ''normal''.	.....	1	.....	
79. Computer failure (critical flight and engine control systems).	Discrete ''fail'' or ''normal''.	.....	4	.....	

The recorded values must meet the designated range, resolution, and accuracy requirements during dynamic and static conditions. All data recorded must be correlated in time to within one second.

Parameters	Range	Accuracy (sensor input)	Seconds per sampling interval	Resolution	Remarks
80. Heads-up display (when an information source is installed).	Discrete(s) ''on'' or ''off''.	.....	4		
81. Para-visual display (when an information source is installed).	Discrete(s) ''on'' or ''off''.	.....			
82. Cockpit trim control input position—pitch.	Full Range	+/−5%	1	0.2% of full range.	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
83. Cockpit trim control input position—roll.	Full Range	+/−5%	1	0.2% of full range.	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
84. Cockpit trim control input position—yaw.	Full Range	+/−5%	1	0.2% of full range.	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
85. Trailing edge flap and cockpit flap control position.	Full Range	+/−5%	2	0.5% of full range.	Trailing edge flaps and cockpit flap control position may each be sampled alternately at 4 second intervals to provide a sample each 0.5 second.
86. Leading edge flap and cockpit flap control position.	Full Range or Discrete.	+/−5%	1	0.5% of full range	
87. Ground spoiler position and speed brake selection.	Full Range or Discrete.	+/−5%	0.5	0.2% of full range	
88. All cockpit flight control input forces (control wheel, control column, rudder pedal).	Full Range Control wheel +/−70 lbs Control Column +/−85 lbs Rudder pedal +/−165 lbs	+/−5%	1	0.2% of full range.	For fly-by-wire flight control systems, where flight control surface position is a function of the displacement of the control input device only, it is not necessary to record this parameter. For airplanes that have a flight control break away capability that allows either pilot to operate the control independently, record both control force inputs. The control force inputs may be sampled alternately once per 2 seconds to produce the sampling interval of 1.

[1] For A300 B2/B4 airplanes, resolution=6 seconds.
[2] For A330/A340 series airplanes, resolution=0.703°.
[3] For A318/A319/A320/A321 series airplanes, resolution=0.275% (0.088°>0.064°).
For A330/A340 series airplanes, resolution=2.20%(0.703°>0.064°).
[4] For A318/A319/A320/A321 series airplanes, resolution=0.22% (0.088°>0.080°).
For A330/A340 series airplanes, resolution=1.76% (0.703°>0.080°).
[5] For A318/A319/A320/A321 series airplanes, resolution=0.21% (0.088°>0.084°).
For A330/A340 series airplanes, resolution=1.18% (0.703°>0.120°).
[6] For A330/A340 series airplanes, resolution=0.783% (0.352°>0.090°).
[7] For A330/A340 series airplanes, aileron resolution=0.704% (0.352°>0.100°).
For A330/A340 series airplanes, spoiler resolution=1.406% (0.703°>0.100°).
[8] For A330/A340 series airplanes, resolution=0.30% (0.176°>0.12°).
For A330/A340 series airplanes, seconds per sampling interval=1.
[9] For all Airbus airplanes, resolution=0.518% (0.088°>0.051°).
[10] For A330/A340 series airplanes, resolution=1.05% (0.250°>0.120°).

[11] For A330/A340 series airplanes, resolution=1.05% (0250°>0.120°).
For A300 B2/B4 series airplanes, resolution=0.92% (0.230°>0.125°).
[12] For A300–600/A310 series airplanes, speed brake resolution=0.224% (0.112°>0.100°).
For A330/A340 series airplanes, spoiler resolution=1.406% (0.703°>0.100°).
[13] For A330/A340 series airplanes, resolution=0.5°C.
[14] For A330 Airplanes with PW or RR Engines, resolution = .29%.
[15] For A330/A340 series airplanes, resolution = 0.352 degrees.
[16] For A318/A319/A320/A321 series airplanes, resolution = 4.32%. For A330/A340 series airplanes, resolution is 3.27% of full range for throttle lever angle (TLA); for reverse thrust, reverse throttle lever angle (RLA) resolution is nonlinear over the active reverse thrust range, which is 51.54 degrees to 96.14 degrees. The resolved element is 2.8 degrees uniformly over the entire active reverse thrust range, or 2.9% of the full range value of 96.14 degrees.
[17] For A318/A319/A320/A321 series airplanes, with IAE engines, resolution = 2.58%.

[Doc. No. 28109, 62 FR 38382, July 17, 1997; 62 FR 48135, Sept. 12, 1997, as amended by Amdt. 121–271, 64 FR 46120, Aug. 24, 1999; Amdt. 121–278, 65 FR 51745, Aug. 24, 2000; 65 FR 81733, Dec. 27, 2000]

PART 125—CERTIFICATION AND OPERATIONS: AIRPLANES HAVING A SEATING CAPACITY OF 20 OR MORE PASSENGERS OR A MAXIMUM PAYLOAD CAPACITY OF 6,000 POUNDS OR MORE; AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

SPECIAL FEDERAL AVIATION REGULATION NO. 38–2 [NOTE]

Subpart A—General

Subpart B—Certification Rules and Miscellaneous Requirements

Subpart C—Manual Requirements

Subpart D—Airplane Requirements

Subpart E—Special Airworthiness Requirements